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Missouri Botanical Garden Bulletin

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—Photo by King Schoenfeld

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Comment

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Looking Forward to a New Year

The new year finds us anticipating some major steps forward. First, I am personally delighted to welcome Dr. Nancy Morin to her new appointment as assistant director of the Garden. Nancy has been a valued member of the research staff since 1981, where her contributions have been enormous and invaluable. She is a superb scientist and a fine administrator, and we look forward to working with her in her new capacity.

On an international level, we are continuing to pursue our very exciting collaborative efforts with colleagues in China, Africa, Madagascar, Latin America, and parts of the former Soviet Union. Assisting these institutions with long range planning, professional training, development of their own resources and fundraising pays off a thousandfold for our own research efforts. Moreover, as you will see in the story on the next page, these goals can be met without sacrificing the Garden's own financial resources.

In our urgent race to identify and save the Earth's priceless global heritage of biodiversity, we will receive a big boost here at home with the opening of our new Conservation Center this winter. The Center, which is adjacent to the Ridgway Center, will enhance our ability to deliver community services and will enrich our local, national and international programs.

Do not be deterred by the weather—there is plenty to do and see at the Garden in winter! The annual Orchid Show, the camellias blooming in the Linnean House, and Black History Month in February are just a few of the exciting things going on. We look forward to seeing you here.

Peter H. Raven

A DISTINGUISHED VISITOR—Professor David Ingram, Regius Keeper (director) of the Royal Botanic Garden, Edinburgh, one of the leading botanical gardens in the world, visited the Garden in October. Prof. Ingram is a member of the editorial committee for the Flora of China project and was at the Garden to discuss collaborative research projects. Shown here at a reception in his honor are (from left): Peter Raven, director; David Ingram; Marshall Crosby, senior botanist; Nancy Morin, assistant director; and O. Sage Wightman III, president of the Board of Trustees.

◀ *The Komarov Botanical Institute in St. Petersburg, Russia.*

Russia's Komarov Botanical Institute is facing the imminent loss of its vital collections of plants. The Garden is leading the effort to save this priceless global resource.

SAVING THE KOMAROV

The Komarov Botanical Institute in St. Petersburg, Russia, which includes a botanic garden founded in 1714 by Peter the Great, has survived economic adversity, climatic brutality, and the bitter sieges of World War II, while remaining one of the most important botanical institutions in the world.

But time has taken its toll on the century-old facilities of the Institute. Botanists there are faced with a very real concern that the deterioration of the physical structures will threaten the invaluable collections of living plants and dried plant specimens.

After hearing about this crisis from his Russian colleagues, Garden director Peter H. Raven has taken a leadership role in helping the Institute find solutions to their problems.

Dr. Nancy Morin, assistant director of the Garden, has spearheaded an effort to assess the physical needs of the Institute as a first step in solving the problems. "This is an important institution that is a global resource—it's everybody's responsibility," she says.

After returning from a visit to St. Petersburg last June, Morin was able to secure funds from the MacArthur Foundation to send in an assessment team. She contacted the Sverdrup Corporation, who had designed greenhouses in the United States for the U.S. Department of Agriculture and had worked on the U.S. embassy in Moscow. Sverdrup agreed to send in a team of their architects to assess the extent of the decay and make recommendations on how to stabilize and improve the situation.

The Komarov houses the third largest herbarium in the world, with an outstanding library and nearly six million specimens of dried, pressed plants. These comprise a vital tool for botanical researchers that cannot be replaced. In addition, its greenhouses safeguard a collection of about 6,000 species of living plants, including many that are in danger of extinction and some that actually are extinct in the wild.

These collections are being threatened by structural deterioration of the buildings housing them,

continued on next page

MISSOURI BOTANICAL
MAR 11 1993
GARDEN LIBRARY

BY Janine Adams

SAVING THE KOMAROV

continued

leaking roofs, and failing heating systems. The harsh winters of St. Petersburg—just seven degrees south of the Arctic Circle—make reliable heating essential. Therefore replacing failing boilers is a high priority, according to the Sverdrup assessment team. Other crucial tasks include providing an emergency generator; replacing the heat distribution system; rewiring and putting new walls and a new roof on the herbarium and library building; and a complete structural renovation and reglazing of the Institute's famed Palm House and related greenhouses.

The price tag for the top priority tasks—those essential to save the plant collections may go as high as $36 million. While this figure is formidable, Raven and Morin are hopeful that they can arouse support from national and international agencies and organizations—sources who can not be tapped to help support the Garden's own work—who would take a special interest in saving this vital institution as Russia enters a new era. At the very least, they hope to provide a starting point for the Russians to follow.

Although just the beginning, the efforts of the Garden and Sverdrup have already been enormously beneficial to the Russian botanists. A St. Petersburg newspaper account of the visits by the westerners prompted the City of St. Petersburg to give the Institute a million rubles. This was the first time in the Institute's history that it had been given money by the city.

In addition, the assessment team offered something less tangible but equally important: hope. With a concrete assessment in hand, the scientists at the Komarov Institute are now equipped to figure out how to tackle their problems. With the technical and logistical assistance of western botanical institutions, a solution now seems possible.

"We gave them hope," says Morin. "No matter what happens from this point on, they now have some very high-quality information that they can use for future planning."

"This is one of the finest institutions in the world," says Raven. "We are proud that two institutions in St. Louis, the Garden and Sverdrup, have been able to play a role in saving this precious resource." ■

CLIFF WILLIS

Meeting in the Garden's library are (standing, from left): J. C. Rearden, architect and senior project manager for Sverdrup; Peter Raven; Charles F. Knepper, Sverdrup mechanical systems specialist; Nancy Morin. Seated: Dennis E. Bopp, vice president of Sverdrup's Architectural Division.

Nancy Morin Is Named Assistant Director of the Garden

CLIFF WILLIS

Nancy Morin with Peter Raven at the reception for the staff.

At a reception for the staff in October, Dr. Peter H. Raven announced the appointment of Dr. Nancy R. Morin as assistant director of the Missouri Botanical Garden. The appointment is effective as of January 1, 1993.

Dr. Morin was named Anne L. Lehmann Curator of North American Botany at the Garden in April 1992 (see the *Bulletin*, July/August 1992). She came to the Garden in 1981 as curator of the Herbarium and editor of the *Annals of the Missouri Botanical Garden*. Since 1983 she has served as convening editor of the *Flora of North America* program, a cooperative international project that will produce the first comprehensive account and database of all plants growing in the wild north of Mexico. She also serves on the editorial board of the *Flora of China* project. She is an adjunct professor of biology at Washington University and is an adjunct assistant professor of biology at the University of Missouri-St. Louis.

continued on next page

RAVEN RECEIVES 1992 AWARD IN SWEDEN

Volvo Environment Prize

AT AN AWARD CEREMONY held on Tuesday evening, November 10, 1992, in the Concert Hall of Gothenburg, Sweden, Dr. Peter H. Raven and Dr. Norman Myers received the 1992 Volvo Environment Prize. The award was presented by Dr. Pehr G. Gyllenhammar, executive chairman of AB Volvo.

The Volvo Environment Prize is awarded annually by the Volvo Prize Foundation to support technical and scientific innovation in the environmental field in the broadest sense. The award is presented to institutions or individuals who have made an outstanding contribution in this area. The Prize was established in 1988 to increase awareness of environmental problems on a worldwide basis and contribute to their solution.

The Prize Committee, headed by Dr. Mostafa Kamal Tolba, executive director of the United Nations Environment Programme, Nairobi, Kenya, included outstanding environmental scientists from Europe, North America and Africa. The committee issued the following statement concerning this year's prize:

"In dealing with environmental problems there is a real need for getting the science right in order to get the policy right. This year's Volvo Environment Prize is awarded to Dr. Norman Myers and Professor Peter Raven, who between them used comprehensive and penetrating scientific analysis of ecological states and trends, and pioneering warnings and courageous expression of concern that have sensitized world opinion to the global consequences of the loss of biodiversity and the process of deforestation, particularly in tropical regions."

In the 1970s, British zoologist Norman Myers was one of the first to recognize the threat of extinction facing various animal species as a result of tropical deforestation. His book *The Primary Source*, published in 1984, was instrumental in awakening worldwide awareness of the problem. Dr. Myers specializes in the study of Africa and its animal life. He has written eight books and hundreds of scientific articles. Dr. Myers and Peter Raven have been close colleagues for many years.

Dr. Raven, who has served as the Garden's director for the past 21 years, has a worldwide reputation as a systematic botanist. Largely through his efforts, the Missouri Botanical Garden today is one of the world's leading centers of botanical research and a leader in public education. Dr. Raven serves as a professor of botany at Washington University, St. Louis University, and as adjunct professor at several other institutions. He has published highly regarded texts on botany and a large number of books and articles on biodiversity of tropical forests. As the Garden's director he oversees or is involved with flora projects on many of the world's regions, including China, North America, Madagascar, and much of Africa, Central and South America. ■

Shown at the Award Ceremony in Sweden are (from left): Norman Myers, Pehr Gyllenhammar, Peter Raven.

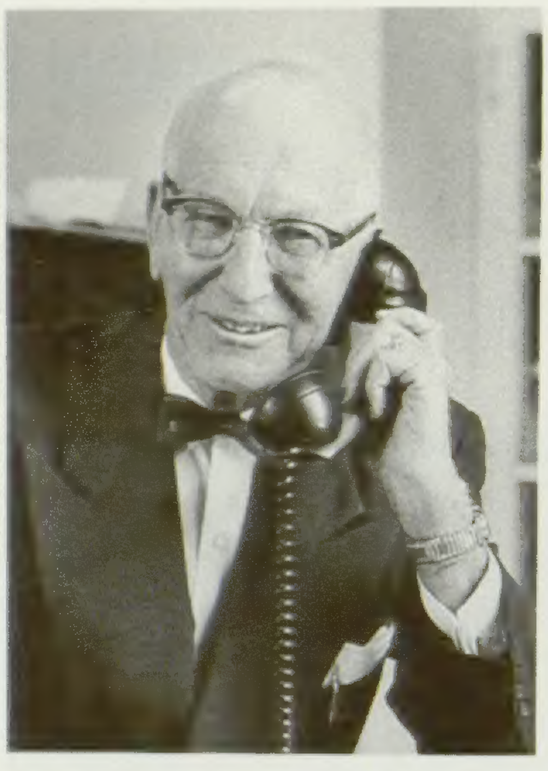
MORIN continued

In announcing the appointment, Dr. Raven said, "Our research efforts have benefited greatly from Dr. Morin's expertise since she has been a member of our staff. She has provided effective leadership at a time of increased professionalization and extensive growth as the Garden has moved into a position of international prominence. I look forward with great pleasure to working with her as a key member of our management team."

As assistant director, Dr. Morin will be concerned with all aspects of Garden administration and with the development and implementation of strategic planning for the Garden. She will continue to be active scientifically and in the leadership of the *Flora of North America* program.

At the announcement of her appointment to the staff, Dr. Morin said, "As many of you know, I have traced my affiliation with the Garden to my great grandfather and grandfather, who both worked here as horticulturists; my great grandfather was on the staff from 1891 until he retired in 1927. Walking beneath the trees that they helped to plant, I feel a deep affection for this institution and gratitude that I have been given the opportunity to contribute to it. I have the greatest respect for the high level of professionalism of every member of the Garden's staff, and I look forward to working with and learning from each of you."

Dr. Morin joined the Garden's Research Division in 1981 following a postdoctoral year at the Smithsonian Institution. She is a graduate of the University of California at Berkeley, where she earned her A.B. degree with highest honors in 1975 and her Ph.D. in 1980. ■



MISSOURI BOTANICAL GARDEN ARCHIVES

◀ *George Pring, the original Answerman.*

30 Years of Questions & Answers

Or, When do I put the Miracle Whip on my strawberries?

BY Chip Tynan

THE Garden's Horticultural Answer Service began in an informal way in 1963 when George H. Pring retired as the active superintendent of the Garden's grounds after almost sixty years of distinguished service. Mr. Pring continued to come to his office for three hours each morning to answer questions from Garden visitors and telephone callers. On an average day, he spoke to as many as 15 to 20 individuals.

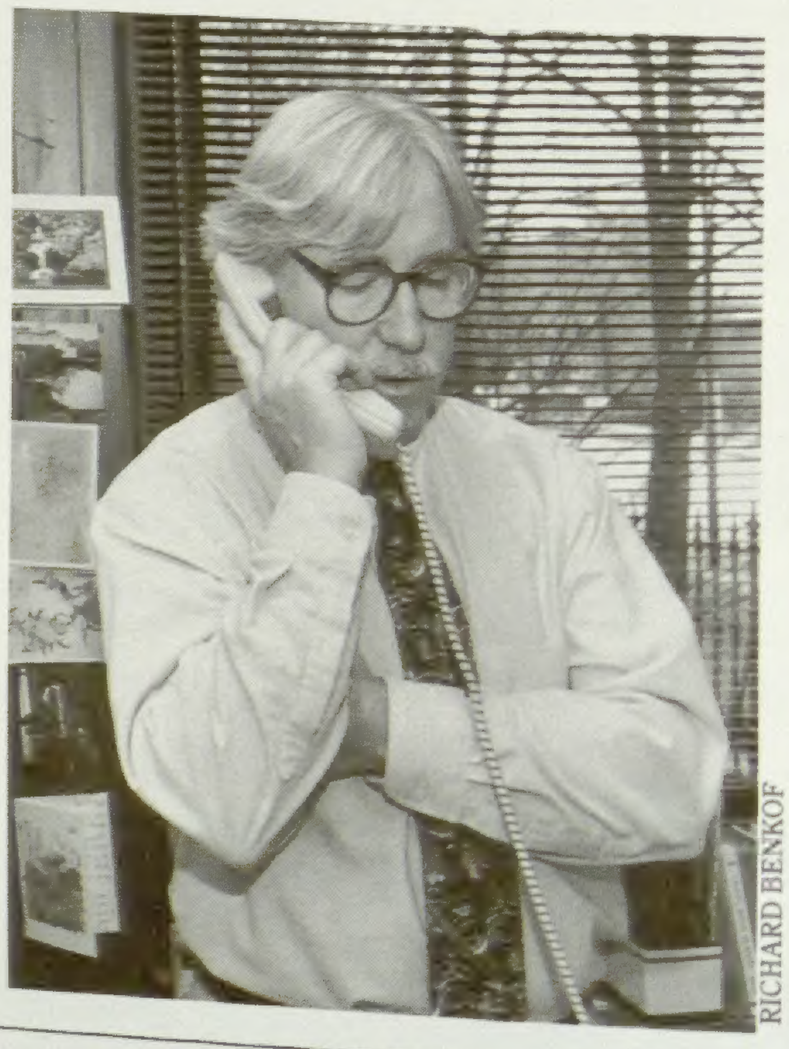
On days when Mr. Pring was unavailable, department heads from the Garden's staff were pressed into service to answer questions. Because these inquiries were time-consuming and kept staff away from their regular duties, it became clear in the spring of 1969, when Mr. Pring moved to Pennsylvania, that an alternative solution was necessary. The Regional Council of Men's Garden Clubs was asked by the staff to provide volunteers on a regular basis during the growing season to assist with this problem. When seven volunteers responded, the Answer Man service was born.

In 1970, Paul Kohl, who for fifty years designed, staged, and grew the plants for the Garden's seasonal flower shows, retired and joined the Answermen. He served as their advisor, answering questions they were unfamiliar with, and answering all calls during the winter months, from November through February. He continued in that capacity until he passed away in 1985.

By 1975 a burgeoning interest in gardening and plant culture made it necessary to increase the number of volunteers. Ten new men were recruited from area garden clubs and they spent their first winter attending weekly training sessions. These classes were organized by John Brown, one of the original Answermen. John just completed his twenty-third year of dedicated service with the group this past fall.

By 1977 the Answermen were joined by their first woman member, Alma Reitz, and the organization has since been known as the Horticultural Answer Service. Today's Answer Service numbers 46 volunteers, of whom more than half are women. It is comprised of six different crews who answer questions on five incoming phone lines for three hours each morning, Monday through Saturday, from March through October. Volunteers are now recruited from the ranks of the Master Gardener program and are required to complete both Level I and Level II training, as well as an on-the-job internship program.

I have the pleasure of supervising the Answer Service. As a full-time Garden employee, my duties include answering the



RICHARD BENKOF

Chip Tynan at work in the Answer Service office. ▶

calls that come into the office from November through February. In this task I usually am assisted by one volunteer each day. During the winter months the volunteers attend a series of weekly enrichment classes designed to improve their diagnostic skills and to keep them abreast of the latest developments in horticulture. These classes are taught by Garden staff, extension specialists from state universities, area professionals from the horticulture industry, and specialty enthusiasts from local plant societies.

Many of the calls we receive are routine, but sometimes they are startling. On one memorable occasion a caller wanted to know, "When do I put the Miracle Whip on my strawberry plants?" With aplomb, the volunteer suggested that strawberries taste better topped with Cool Whip, but that Miracle Grow fertilizer could be applied to the soil after the harvest season.

Some inquiries have an otherworldly quality. One caller, intent on visiting the Garden, phoned for directions; moments later the same person called back to request directions "for a neighbor," who wanted to know how to get home from the Garden.

Occasionally we will be called upon to settle family disputes. One frantic call came from a woman whose husband, having just read a trendy article describing the culinary delights of violet flowers, stood poised with scissors in hand, ready to snip the blooms from her prized African violets. Her collection was saved when we explained that African violets of the Gesneriaceae family, are very different from the tasty violets of the Violaceae family described in the magazine.

One of the most unusual inquiries came one autumn from a caller who was bringing in houseplants that had spent their summer outdoors on the patio. Sowbugs had taken up residence in the pots, and the lady informed us that she used to have a monkey who "would eat all the sowbugs, but I'll be darned if I'm going to get another monkey." We agreed that this was a creative solution to a tough problem. Fortunately, we could suggest some alternative methods of pest control.

From the original service of one man answering about 20 to 40 calls each day, the Answer Service has grown steadily over the years and in 1992 fielded over 30,000 calls, with as many as 204 inquiries in a single three-hour period. This reflects not only the growing interest in gardening, but also the Garden's continuing commitment to public education in horticulture. ■

RICHARD BENKOF

MISSOURI BOTANICAL GARDEN ARCHIVES

Above: Master Gardeners (from left) Ann Case, Herman Easterly and Carol Wilson staff the phones.

Left: The late Paul Kohl (on stairs, center) with a group of Answermen.

New 24-Hour "HortLine"

Enclosed in this *Bulletin* is a brochure for a new and exciting gardening service developed by the Garden's William T. Kemper Center for Home Gardening. This service, called HortLine, provides gardeners with direct access to help on nearly 200 common gardening subjects, 24 hours a day, 365 days a year.

Now those of you who garden by moonlight need not wait for the sun to rise to get answers to your questions! You can listen to prerecorded messages from a touch-tone phone by using the simple directions in the brochure. Needless to say, it's just as easy for daytime gardeners.

HortLine will not replace the popular one-on-one service available through the Horticultural Answer Service. In fact, the Answer Service is being expanded steadily to meet the ever growing demands for its services. HortLine will supplement the Answer Service, providing greater flexibility in getting answers to gardening questions.

The St. Louis Master Gardeners, who staff the Garden's Horticultural Answer Service, played a critical role in editing, writing and recording the HortLine messages, and in testing the completed system. Without their expertise, dedication and long hours of work, the system could not have been completed. Master Gardeners, together with Garden staff, will continue to be involved in producing new messages and updating current messages as required.

We hope you will take the time to become familiar with the system. It's easy! Now a wealth of gardening information is only a phone call away.

See the brochure in the center of this *Bulletin* for details.

The exhibit that won the AOS Gold Medal Certificate. ▶

The annual Orchid Show features many rare and endangered plants

A Spectacular Showcase

This Phragmipedium wallisii *'Tower Grove' from the Garden's collection was awarded an AOS Highly Commended certificate in 1990. It is an endangered species native to Colombia and is listed in Appendix 1 of CITES.*

THE Garden's Orchid Show is the most popular of all the annual flower shows, and with good reason. Orchids are spectacular flowers, coming in all sizes, shapes and colors from all over the world, especially the tropics. The family Orchidaceae has more than 20,000 species in over 700 genera, one of the largest and most diverse of the more than 300 families of flowering plants in the world.

Orchids have long been prized by growers and collectors for their exotic beauty. Unfortunately this has led to overcollection of wild specimens, and today many species of orchids are endangered or extinct in the wild. In addition, orchids, like all plants, are affected by loss of habitat. Orchids are especially vulnerable because many species are restricted to very specific habitats. Often they are dependent upon one particular type of soil or one particular pollinating insect for survival.

With a notable collection of about 12,000 plants, including more than 3,500 species, varieties and hybrids, the Garden's orchid collection includes a large number of orchids that are endangered or extinct in the wild.

All rare plants are protected by law, as are animals. International trade in plants is regulated by the Convention on International Trade in Endangered Species (CITES), a treaty that took effect in 1975. Today about 100 countries have ratified it. While CITES is often difficult or impossible to enforce, the goal of the treaty is to control trade in plants according to their degree of endangerment, with the species listed in Appendix 1 virtually banned from movement if they are collected in the wild. Species listed in Appendix 2 require export permits. All orchid species are listed in either Appendix 1 or 2 of CITES.

While some of the older plants in the Garden's collection were wild collected many years ago, today all plants are acquired legally from growers or researchers. Of the nine orchid species individually listed in Appendix 1 of CITES, the Garden holds five. All species of *Phragmipedium* and *Paphiopedilum* are listed in Appendix 1, and the Garden has a large number of species, hybrids and cultivars from these two genera. Overall, the collection includes about 45 percent of the species listed in CITES Appendix 1, some dating from the early 1900s.

Thanks to a grant from the Mid-America Orchid Congress, the Garden is purchasing a number of slipper orchids to enhance its already excellent holdings in this area, and

recently several rare species were acquired from Selby Gardens through the USDA Plant Rescue Program. These plants had been illegally collected in the wild and were confiscated from illegal importers.

"It is the goal of conservation to preserve species in the wild," says Marilyn LeDoux, curator of the Garden's orchid collection. "But it is better to preserve species in cultivation than not at all."

The Orchid Show offers an annual opportunity to see a wide array of these magnificent plants on display. The show opens with a special preview for Garden members on Friday, January 15 (see page 12). ■

PROFILE / Brian and Marilyn LeDoux

A Prizewinning Team

At the Orchid Society of Greater St. Louis Show held at the Garden October 17 and 18, the Garden won the American Orchid Society's highest award, the Gold Medal Certificate, for a 90-square-foot display by Brian and Marilyn LeDoux of the Horticulture Division. The Garden also won the AOS Show Trophy for the display, which was designed by Brian and featured plants grown by Marilyn.

The Gold Certificate is infrequently given. To qualify, an exhibit must score at least 90 points out of 100; the Garden's exhibit earned 92 points. Individual plants in the exhibit won two special trophies, eight awards for special merit, 16 first place, 14 second place and seven third place ribbons. There were 21 other exhibits entered in the competition by commercial growers, orchid societies and individuals from several midwestern states.

The LeDoux "Grow and Show" team is now two for two in AOS competition. A year ago Brian and Marilyn won the coveted Gold Certificate at a regional show in Louisville, Kentucky. Since 1985, orchids from the Garden's collection have earned 53 AOS awards in competition.

Much of the credit is due to Marilyn LeDoux, who took over the care of the Garden's orchid collection in 1984 when Marion Pfeiffer retired. Marilyn joined the Garden's Horticulture Division in 1979, and she and Brian were married in 1981. She earned her B.S. in horticulture from the University of Missouri-Columbia and is currently an AOS student judge, working to complete the six-year training process to become fully accredited.

Brian, head of Exhibit Design at the Garden, joined the staff in 1975. He has a B.S. in education with a major in fine art from Northeast Missouri State. "I went to work in the Climatron," he says, "and right away started doing flower shows. We also did regular monthly educational displays in the Climatron, Desert House and the old Mediterannean House. The Orchid Show used to be held in the Climatron; in 1978, when the old Floral Display House burned down, the Holiday Show moved into the Climatron as well. The Spring and Fall shows were held in a tent outdoors until the Ridgway Center opened in 1982."

In addition to developing the four annual Flower Shows, Brian is responsible for all the plant society shows and exhibits held in the Ridgway Center. He writes and produces the educational brochures for the shows and handouts for the Garden Guides.

The Making of a Flower Show

Planning begins a year ahead for the Garden's popular flower shows. The horticulture staff grow some of the plants that are used, and often the shows feature plants from the Garden's collections. It can take many months to grow large display plants or train them into special shapes. Many of the plants must be ordered from commercial growers a year in advance, and cuttings must be purchased to be cultivated here.

"You never quite know what's going to happen," Brian says. "The weather can be a problem, and sometimes things just don't come into flower when they're supposed to." Because the shows feature living plants, they must be trimmed, watered and sometimes replaced during the course of the show.

Brian picks a theme for the show, designs a floor plan, plans the plants and props around it. Props and sets are actually built by two volunteers, Bob Lumley and Horace Allen. "We recycle things all the time," Brian explained. "We often repaint or remodel sets to get a new look."

Designing competition exhibits for Marilyn's orchids is another kind of challenge. "The plants must be the primary interest," Brian said, "and the setting must enhance them without overwhelming them. It's especially difficult when the exhibit has to travel. You have to take everything with you, including labels and lights, and everything has to break down into pieces that will ride securely in a truck, including the plants. Then when you arrive, you have to make sure everything will fit through a doorway!"

Teaming up seems to work; most visitors would agree that the Garden's displays succeed in spectacular fashion. Brian and Marilyn's finest efforts will be on display at the Orchid Show this month. (See page 12.)

A Green Solution to Air Pollution

Cleaner Indoor Air

Most of us would agree that plants make us feel good. Nowhere is this more apparent than in our homes and businesses. Studies have revealed that people strongly prefer indoor settings with plants. While this is important psychologically, plants may also directly benefit our indoor environment and physical health. How? They appear to be cleaning the air.

In the late 1970s, at the height of the energy crisis, great efforts were made to begin creating energy-efficient buildings. This resulted in tighter structures with less ventilation from the outside air and more insulation to keep interior temperatures constant. Buildings and homes are now less drafty, but more atmospherically isolated.

As a result, today's buildings are reportedly filled with air pollutants given off by building materials. The World Health Organization estimates that perhaps 30 percent of new and remodelled buildings may have indoor air quality problems due to inadequate ventilation, contamination from outside sources, biological contamination and air pollutants from building materials. In 1988, the Environmental Protection Agency issued a report on the causes of "Sick Building Syndrome," or SBS. There is growing awareness and concern about "building related illnesses."

How does one solve these problems? There is no easy answer. Of course better ventilation, air filtration, and the removal of source pollutants are logical first steps. But the latest weapon used to fight indoor pollution is the common houseplant.

Evidence for plants as indoor filtration systems comes from NASA's National Space Technology Laboratories. Their task was to discover effective technology to clean the air inside future space stations and spacecraft on long journeys. Studies at the Stennis Space Center in Mississippi have concluded that plants can do the job of cleaning the air of several major air borne chemicals.

Common Air Pollutants

Among the hundreds of trace organic volatile compounds in the air at any one time, the three most commonly found in our homes and offices are benzene, trichloroethylene and formaldehyde.

Benzene is used in the manufacture of oils, paints, plastics, rubber, detergents, pharmaceuticals and dyes. It is a proven carcinogen and has been linked to leukemia in humans.

Trichloroethylene is widely used in dry cleaning, inks, paints, adhesives, and as a degreasing agent.

Formaldehyde is found in all indoor settings. It is the basis for ureaformaldehyde insulation and is used in the production of particle board, wax paper, facial tissue, paper towels, many household cleaning agents, and in floor carpeting and carpet backing.

Living Air Filters

The plants used in early trials to reduce levels of the three indoor air pollutants above were common houseplants. Most are lowlight plants that grow well in dim interior areas.

One of the most efficient air cleaners was the spider plant, *Chlorophytum elatum*, otherwise known as the airplane plant. Further testing was done with mass cane, *Dracaena marginata;* pot mum, *Chrysanthemum × morifolium;* dracaena 'Janet Craig,' *Dracaena dermen sis*; mother-in-law's tongue, *Sansevieria laurentii*; Gerber daisy, *Gerbera jamesonii*; golden pothos, *Scindapsus aureus*; peace lily, *Spathiphyllum* 'Mauna Loa;' Chinese evergreen, *Aglonema modestum*; ficus, *Ficus benjamina*; bamboo palm, *Chamaedorea seifrizii*; and several common philodendrons.

Experiments were conducted in sealed chambers injected with ambient levels of each of the three air pollutants described above. The tests revealed that in fact some of the houseplants removed between 10 and 40 percent of the chemicals in a 24-hour period. Pot mums and Gerber daisies were especially effective across the board. Other plants were more selective, removing more of one compound than another.

Potting soil also was found to participate in the reduction of all three chemicals. Some correlation has been made between air purification and the activity of soil microorganisms in association with plant roots. This has led to the marketing of a new type of plant container which features activated charcoal incorporated into the potting soil, with an attached motorized system to draw air through the soil.

Prior to this development researchers suggested that just 15 to 20 of the most active air-filtering plants would be sufficient to reduce trace chemicals to insignificant levels in the average home. With the development of the new charcoal-forced air system, one pot is said to do the job of many passive plants, although you will pay upwards to $100 per system.

Do they really work?

No one really knows what impact plants have on our physical health associated with air purification. At this point, just how plants can reduce certain indoor air pollutants is still a mystery. Skeptical scientists suggest that the best approach is to concentrate on reducing air pollutants at the source and not to focus too much on systems to remove them after they are present. Nevertheless, it's good to be reminded that life on Earth depends upon a vital biological support system, which does more for us than we imagine, even indoors.

—Steven D. Cline, Ph.D.
Manager, Kemper Center for Home Gardening

Kemper Center for Home Gardening

Open 10 a.m. to 4 p.m. daily. Plant Doctor available 10 a.m. to noon and 1 to 3 p.m. Monday through Saturday. Free with regular Garden admission.

From the Answer Service

With this issue we begin a new format for "From the Answer Service." We hope you find it enjoyable and informative.—Editor

Do you have a plant question? Call the Horticultural Answer Service, Monday through Friday, 9 a.m. to noon, at ***577-5143.***

How do I care for a poinsettia?

Holiday poinsettias must be kept evenly moist. Dry soil is a common cause of premature leaf loss. Get into the habit of probing the soil with your fingertips to determine watering needs. When the soil surface begins to dry, water thoroughly enough to produce drainage. Gift plants often come with a colorful foil wrap around each pot. While these wraps are cheery and decorative, they also retain water, promoting soggy soil conditions that may injure the plant. Be sure to either remove the foil wrap or punch holes in it to prevent excess water from collecting at the base of the pot. To prolong their color season, keep poinsettias in bright light during the day and place them in a cool (60° F) spot at night. Locate them away from sources of hot, dry air at all times.

I didn't get my bulbs planted yet. What can I do to keep them fresh so I can plant them next fall?

This question is asked with dismaying frequency throughout the winter. If there is such a person as the "gardener with a green thumb" then this person is certainly characterized by a sense of timing. Learning your plants' requirements and tending their needs in the proper season usually spells the difference between success and failure. As long as the soil is unfrozen and bulbs remain firm and sound, they should be planted. Additional storage, even under cool conditions, will only delay the inevitable. That is, even if they are not planted, bulbs will eventually sprout. Without soil to root themselves, the bulbs will consume their own stored food reserves, wither and die.

This late in winter, not enough time remains to force bulbs properly, and if unworkable soils prevent planting, pot them in containers filled with a well-drained potting soil. Water well, and place the containers outdoors in a shaded location. Mulch the pots to prevent frost injury. A cold frame would be ideal, but if you don't have one, burying the pots beneath a foot or two of leaves or straw will suffice. These bulbs can then be transplanted, still in containers, into annual beds as the soil conditions allow. With luck, they should bloom at their proper time. Once flowering is past, dig the pots up and your flower beds can then be planted to annuals, with no delays while waiting for bulb foliage to ripen.

A Winter Wish List

Now that the spring gardening catalogs have begun to arrive by mail, be sure to look for those carrying the new All-America selections. 1993 brings us two new flowers and two vegetables. *Verbena* 'Imagination,' with a vigorous spreading habit and deep violet-blue flowers, can be grown in garden beds or in hanging baskets. Suitable for full sun, 'Imagination,' like other verbenas, is heat and drought tolerant, making it a promising introduction for St. Louis conditions. *Nierembergia* 'Mont Blanc,' another heat-loving, low, spreading annual, is the first white flowering nierembergia grown from seed. Related to petunias, *Nierembergia* 'Mont Blanc' is also drought tolerant. This versatile performer is suitable for garden bedding, handing baskets, patio containers and window boxes.

Tomato 'Husky Gold' is a disease resistant hybrid with medium size, early maturing fruits that are a deep golden orange both inside and out. Having a dwarf, compact, indeterminate habit, 'Husky Gold' is suitable for either garden or container planting, needing only a small trellis for support.

Pumpkin 'Baby Bear' is sure to be a hit with all gardeners, but especially those with young children. Though larger than the popular 'Jack Be Little' and 'Munchkin' varieties, 'Baby Bear' produces a small one-and-a-half to two-pound rich orange pumpkin on normal size vines. Having a classic Jack o'Lantern shape, 'Baby Bear' stores well and can be used for holiday decorations or as filling for pumpkin pie.

Gardeners who wish to grow these All America selections can obtain the names of mail order sources by calling the Answer Service office or by browsing through the many garden catalogues on display in the Kemper Center for Home Gardening.

—Chip Tynan
Horticultural Answer Service

Master Composter Hotline: 314/577-9555

Dr. Raven (left) is greeted by Pope John Paul II.

Raven Attends Pontifical Academy

Dr. Peter H. Raven, director of the Garden, recently attended the biannual meeting of the General Assembly of the Pontifical Academy of Sciences in Rome. Dr. Raven is one of 80 members of the Academy, an international scientific body that advises the Pope on scientific matters.

The theme of this year's meeting was "The Emergence of Complexity in Mathematics, Physics, Chemistry, and Biology." Dr. Raven presented a paper on "Dimensions and Diversity of Life on Earth," which sparked a renewed interest among Academy members in the problems of preserving biodiversity worldwide.

Missouri Botanical Garden

CALENDAR OF EVENTS

January-February 1993

JANUARY 16-FEBRUARY 14 / Orchid Show "A Tropical Garden of Orchids"

9 a.m. to 5 p.m., Orthwein Floral Display Hall. The fragrance of thousands of orchid flowers fills the air of an old abandoned formal tropical garden. Exotic blooms and foliage frame a central courtyard, spill from magnificent moss-covered urns and surround a terrace with a lion's head fountain. Old parterre beds long ago overgrown support trees covered with more colorful orchids and draped with Spanish moss to complete this timeless, ethereal scene.
For Members' Preview, see January 15.

MEMBERS' EVENTS

JANUARY 20
Members' Day

"Growing and Caring for Houseplants"

11 a.m., Shoenberg Auditorium. A demonstration lecture by Dr. Steve Cline, manager of the Kemper Center for Home Gardening. Includes a handout on care of the most common houseplants. Free, for members only. Limited seating.

FEBRUARY 18
Members' Day

Climatron Ramble

11 a.m. and 2 p.m. Continuous guided tours conducted by the staff of the Climatron. Learn about the exotic and diverse plants that inhabit our St. Louis rain forest. Meet in the Ridgway Center to form tour groups. Free, for members only.

JANUARY

10 SUNDAY

Exhibit: "The Plant Hunters: A Portrait of the Missouri Botanical Garden"

9 a.m. to 5 p.m. daily through January 24, Ridgway Center. Magnificent color photographs of the Garden and its research activities by James P. Blair, staff photographer for *National Geographic*. Free with regular Garden admission.

15 FRIDAY

Members' Preview, Orchid Show

5 to 8 p.m., Ridgway Center. Entertainment, Cash Bar. Dinner Buffet is available in the Gardenview Restaurant. The Orchid Sale will be featured in the Garden Gate Shop. *See highlight.*

16 SATURDAY

Orchid Sale

9 a.m. to 5 p.m. daily through February 15, Garden Gate Shop. Members receive a 20% discount on all orchids plus bark, fertilizer and wire accessories. Sale opens Friday evening during the Member Preview; see January 15.

30 SATURDAY

Exhibit: "Black & White"

9 a.m. to 5 p.m. daily through February 28, Ridgway Center. In honor of Black History Month, this display will feature the work of four Missouri African-American photographers. Sponsored in conjunction with Portfolio Gallery and Educational Center. Free with regular Garden admission.

The Climatron

Around the World in One Hour

Don't let the cold outside deter you—the winter months are a delightful time to tour the Garden with the Garden Guides. Enter the warm Desert House where the Saguaro grow. A few steps away and you are in the Climatron, a steamy rain forest where bananas hang overhead. A few steps more take you into the Shoenberg Temperate House with its Moorish garden and dry Mediterranean atmosphere. In the Linnean House the camellias are blooming, and as you walk the grounds look for witch hazel, the first flowering shrub of the new year.

Join the Guides every Tuesday, Saturday and Sunday at 1 p.m. for a free tour. You'll learn more than you ever imagined.

Tower Grove House Tea Room

Open for luncheon Monday through Friday, 11:30 a.m. to 1 p.m., February through November. Advance reservations only. Call 577-5150.

Garden Walkers' Breakfast

7 to 10:30 a.m., every Wednesday and Saturday. Restaurant and grounds open early; free admission until noon. Sponsored by the American Heart Association. Call 577-5125 for information.

21 SUNDAY

Children's Climatron Tours

2 to 5 p.m., Climatron. Join students from the Henry Shaw Academy who have been studying rain forest ecology for special tours of the Climatron. Learn about the Climatron's diverse habitats, the problems of deforestation and loss of biodiversity, and ways to preserve rain forest habitats and help rain forest dwellers. Free with regular Garden admission.

February is Black History Month

CLIFF WILLIS

"Celebrate the Gospel" was a highlight of Black History Month in 1992.

"On Road to the Dream"

Join us for a month-long celebration of the accomplishments of African-Americans in the arts, music and sciences. There will be a special focus on the flora of Africa. For a schedule of activities call 577-5125.

Center for Plant Conservation

CPC and U.S. Forest Service Join Forces To Conserve Rare Plants

The Center for Plant Conservation and the USDA Forest Service have banded together to save rare and threatened plants in national forests and grasslands. The two organizations signed a landmark memorandum of understanding at Rancho Santa Ana Botanic Garden in Claremont, California, during the CPC's annual meeting of Participating Institutions on Monday, November 16, 1992.

Under the agreement, native, imperiled plant populations will be conserved in the wild, and the organizations will work jointly to further public education and understanding of the plight of endangered plants in the United States.

The Center for Plant Conservation is the only national organization dedicated exclusively to preventing the extinction of native plants. Headquartered at the Missouri Botanical Garden in St. Louis, the CPC works with a network of 25 botanical gardens and arboreta nationwide to collect and maintain endangered plants as part of the National Collection of Endangered Plants. The National Collection consists of more than 400 different species of threatened and endangered plants. The Collection is used for germplasm storage, research, education, and as potential stock to reestablish species in their native habitat.

"The Center for Plant Conservation is pleased to enter into a national cooperative partnership with the Forest Service as part of our strategy to protect plant diversity," said Donald A. Falk, CPC executive director. "National Forest lands are important reserves for biodiversity and plant conservation. These lands provide habitat for at least 81 federally listed threatened or endangered plants and for another 1,650 sensitive plant species protected by the Forest Service," Falk added.

The Forest Service manages 191 million acres of public land, ranging from subarctic Alaska to tropical Puerto Rico, including lands in 43 states comprising 156 national forests and 19 national grasslands. The Forest Service is responsible for the protection and management of fish, wildlife and plant habitats.

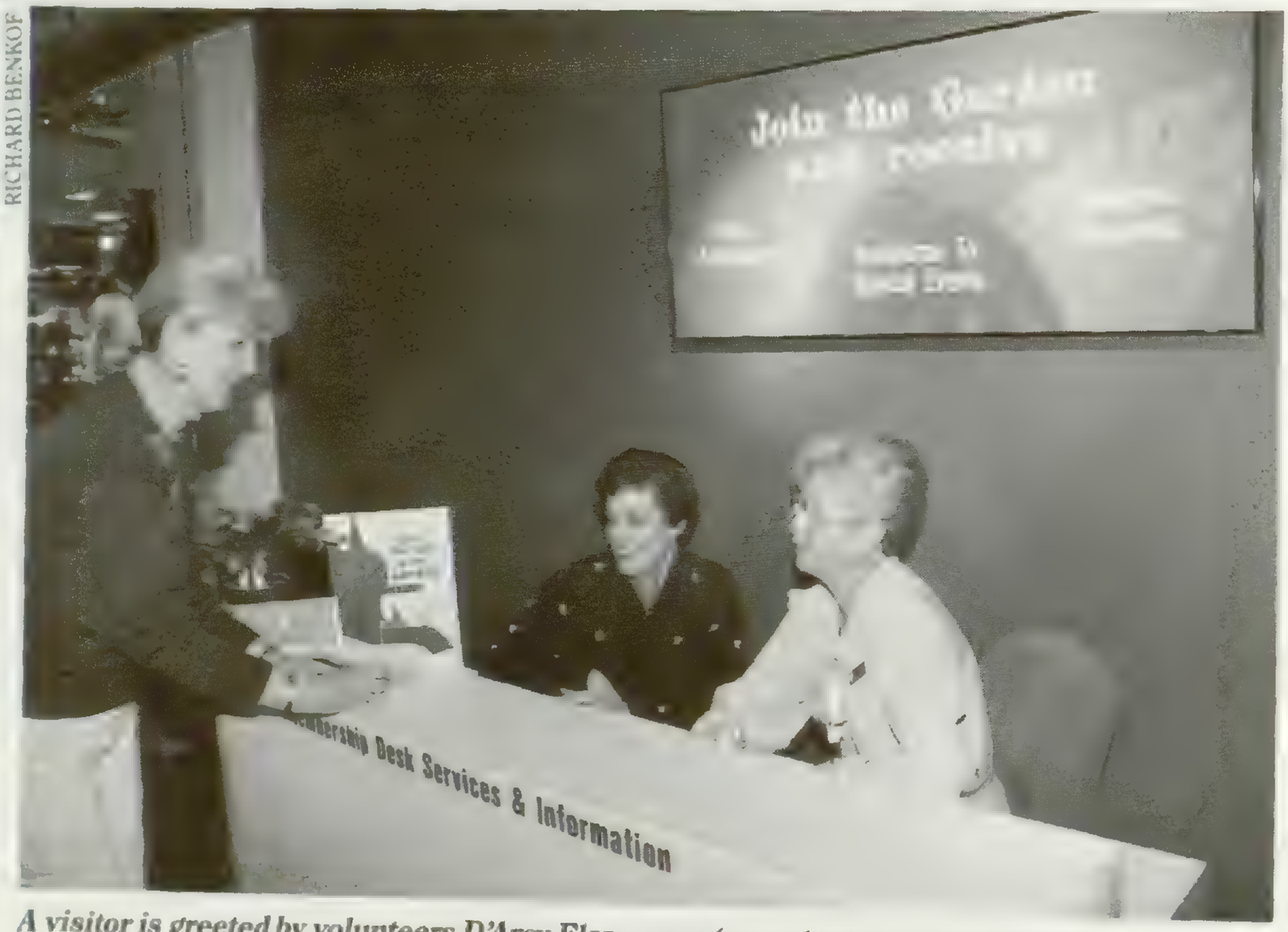
"The Forest Service and the CPC have mutual interests in plant conservation," said F. Dale Robertson, chief of the Forest Service. "We will be working together on all levels to protect plant species throughout the United States. During the past three years we have emphasized our rare plant program, tripling the number of professional botanists on our staff."

Other projects to be undertaken through the agreement include collection, propagation and maintenance of the National Collection; sharing of databases concerning the biology, horticulture and conservation status of all nationally endangered plants; identification of special management areas; and monitoring activities.

One of the most important strategies for conserving endangered plants is ecology restoration and reintroduction. "Forest Service lands present tremendous challenges and opportunities for endangered species management, including the potential to reintroduce species that have been lost from their native habitat," said Falk. The CPC is organizing a national reintroduction symposium April 20-22, 1993 in St. Louis.

The CPC estimates that about 4,200 species of U.S. plants—roughly one-fifth of the country's entire native flora—are of conservation concern. Of these, close to 800 species may be within a decade of extinction.

RICHARD BENKOF



A visitor is greeted by volunteers D'Arcy Elsperman (seated left) and Pat Becklean.

A Welcoming Sight

The Membership Services and Information Desk in the lobby of the Ridgway Center is one of the first things to welcome visitors to the Garden. Both current and prospective members are greeted with a smile and friendly, helpful answers to their questions.

"It's definitely a major boost for our Membership Program," said Brenda Banjak, membership coordinator. "By the end of October the volunteers who staff the Desk had renewed 1,097 memberships and had enrolled 1,339 new members, for a 1992 revenue total of $104,173. But just as important, the volunteers on the Desk make people feel welcome, especially visitors who have never been here before."

By the end of October the volunteers on the Membership Desk had given a total of 2,034 hours of service under the outstanding leadership of co-chairs D'Arcy Elsperman and Jean Crowder. The Desk volunteers were honored for their achievements at a luncheon held in Spink Pavilion November 12. Everyone at the Garden extends these very special volunteers our heartiest thanks.

1993 Members' Days

Here is a preview of the exciting calendar of special monthly events planned just for Garden members:

Jan. 20	*Lecture: "Growing and Caring for House Plants"*
Feb. 18	*Climatron Ramble*
Mar. 10	*Lecture: "Growing Perennials in St. Louis"*
Apr. 3	*Arboretum Spring Walk*
May 14	*Purple Martin Evening*
Jun. 18	*Members' Musical Evening*
Jul. 21	*Herbarium Tour*
Aug. 5	*Herb Day*
Sept. 30	*Potting Plants to Bring Indoors*
Oct. 17	*Autumn Cider Stroll*
Nov. 16	*Winter Decorating*
Dec. 11	*Imaginary Theatre Company*

New Format for Members' Mailers

You have probably noticed that Garden mailers are looking a little different these days. We hope you like our new format. By publishing three months of activities in one brochure we save paper, postage and printing costs and put more of your membership dollars to work on Garden programs. Please save your brochures as a handy guide to upcoming events.

Membership Services & Information Desk Volunteers

Mrs. Richard H. Bauer
Mr. and Mrs. Frank V. Becklean
Mrs. Lillian Biggs
Mrs. William Bock
Mrs. Stephen F. Bowen, Jr.
Miss Ruth E. Buerke
Mrs. W. Pedrick Conway
Mrs. Oscar C. Crider
Mrs. William B. Crowder
Dr. Marie Lewandowski Davis
Mrs. John K. DeBernardi
Ms. Bonnie Dewes
Mrs. Robert P. Elsperman
Miss Margaret L. Fisher
Mrs. Jean M. Fuchs
Mrs. Louis M. Gibson
Mrs. Robert H. Harper
Mrs. Walter W. Heffernan
Ms. Marilyn Heneghan
Ms. Norma Hill
Mrs. Carlisle D. Kinyon
Mrs. Robert H. Kittner
Mrs. Harry W. Kroeger
Mrs. Charles E. Leonhardt
Mrs. William H. Leyhe
Mrs. Timmie Massey
Mr. Paul McClinton
Mr. Stanley McLean
Mrs. Louis Neuner
Mrs. Charles W. Oertli
Mr. Carl Pride
Mrs. William G. Raith
Mrs. Rudyard K. Rapp
Mrs. Olive Rheinnecker
Mr. William R. Richardson
Mr. and Mrs. John R. Roedel
Mr. and Mrs. Gene V. Spradling
Mr. and Mrs. Lawrence W. Thilking
Mrs. John R. Tucker, Jr.
Mrs. Leon P. Ullensvang
Mrs. Loren M. Walbaum
Mrs. Donald Zuehlke

1993 MEMBERS' TRAVEL PROGRAM

Each of these tours offers Garden members a thrilling adventure. Enrollment is limited, so plan to register early. For brochures and complete information on costs and deadlines, please call Brenda Banjak at (314) 577-9517.

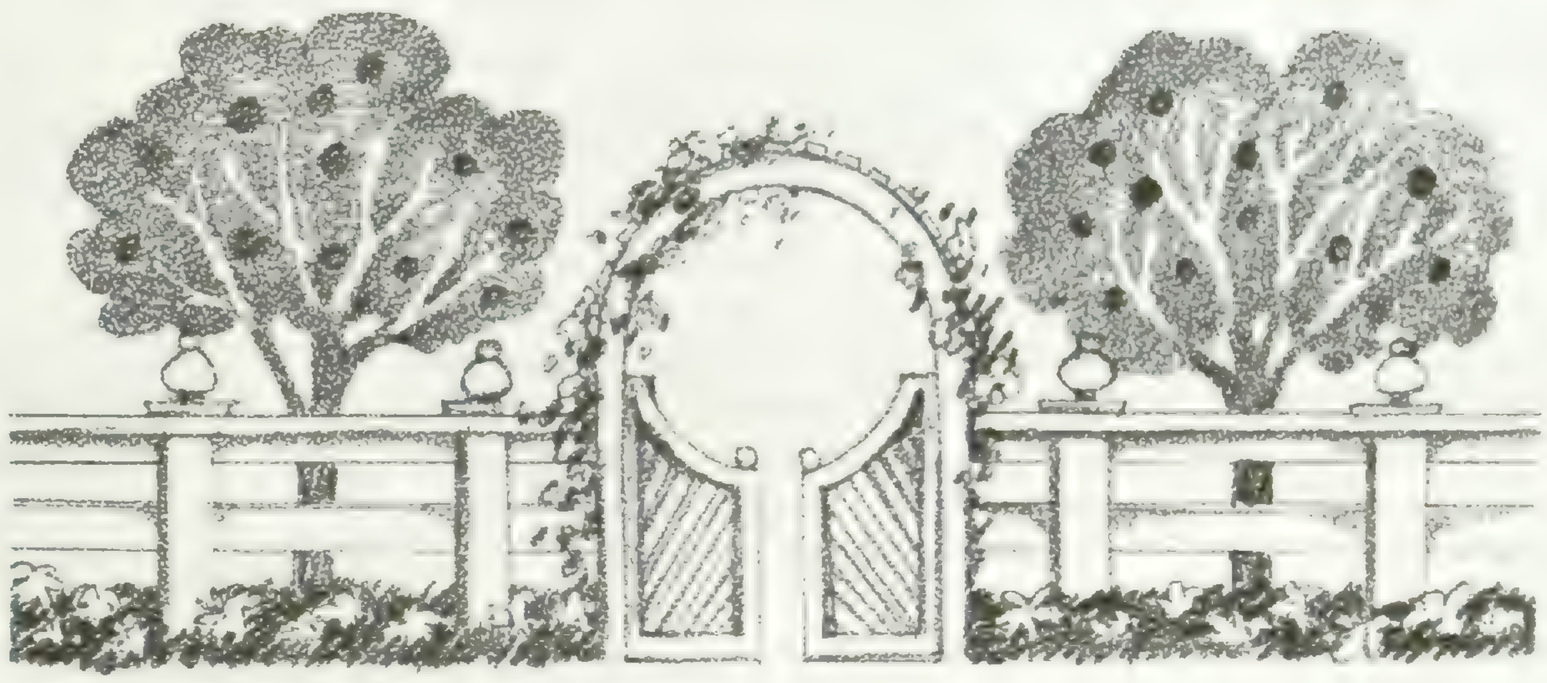
Costa Rica
MARCH 13 TO 22, 1993

Madagascar
APRIL 2 TO 16, 1993

Austria, Switzerland, Alsace and the Rhine Valley
AUGUST 10 TO 23, 1993

Flowers and Candy for Your Valentine

This Valentine's Day send a year of flowers with a Missouri Botanical Garden Membership and a box of Fannie May Candy to your special Valentine. Call 577-5118 to order your Valentine membership. Gift recipients in the St. Louis metropolitan area will receive your unique Valentine gift delivered to their doorstep on February 14.



COMING IN JUNE 1993/A New Garden Tour!

Mark June 6, 1993 on your calendar today for our fourth Garden-sponsored tour of some of the most spectacular private gardens in St. Louis. A Garden Tour is held every few years and is one of the most popular of our special events for members only.

Watch upcoming issues of the *Bulletin* for details. A special invitation will be mailed to all members in April.

Gift Membership Order Form

Gift to: (Please print) Name_____

Address_____

City_____ State_____ Zip_____

Day Telephone_____

Gift from: Name_____

Address_____

City_____ State_____ Zip_____

Day Telephone_____

Please sign card:_____ Date needed by:_____

Regular membership: $45. Seniors (age 65 and over): $40

☐ My check for $_____ is enclosed.

☐ Please charge: ☐ VISA ☐ MasterCard

Amount: $_____

Account No._____

Name on card:_____

Expiration date:_____

Signed:_____

Make checks payable and mail to: Missouri Botanical Garden, P.O. Box 17419, St. Louis, Missouri 63178-0299

Call **577-5118** for more information.

NSF Awards $1.3 Million to Garden's Research Programs

The international work of the Garden's research department was given a boost this fall with the awarding by the National Science Foundation (NSF) of some $1.3 million dollars for six different projects. "These research grants are very important to furthering the Garden's botanical research," said Garden director Peter Raven. "They will allow us to add tremendously to the existing body of knowledge about plants."

China

The largest of the six grants was $450,000 over three years awarded for the *Flora of China* project. This project is a joint Sino-American effort to revise, condense, and translate into English the massive Chinese-language *Flora Reipublicae Popularis Sinicae*, a catalog of plants growing in China begun in 1959. Twenty-five volumes will be produced over the next 15 years, with the first volume to be published in 1993. A computerized database is also being developed on the names, characteristics and distributions of the approximately 30,000 species of Chinese plants. The recent NSF grant will provide funds for salaries, meetings, equipment and database development. This is the second NSF grant received by the Garden for the *Flora of China*. The first, awarded in 1989, was instrumental in getting the project started. The principal investigators of the project are Dr. William Tai and Dr. Ihsan Al-Shehbaz of the Missouri Botanical Garden.

Bolivia

The National Science Foundation, together with the U.S. Agency for International Development, awarded $274,836 over three years for a botanical inventory of Noel Kempff Mercado National Park, a newly established protected area in the eastern Bolivian lowlands. The Park encompasses a wide variety of habitats, including evergreen forest, savanna grassland, deciduous forest, and wetland marsh. It is situated in the center of the South American continent, in a region that has never been subject to an extensive botanical inventory. Dr. Timothy Killeen, the Garden's resident botanist in Bolivia, is the principal investigator for the project. Killeen will work closely with the National Herbarium of Bolivia and the university in Santa Cruz to carry out plant collecting expeditions in the region. Training programs for Bolivian students and scientific professionals are an integral part of this project.

Chile

A NSF/AID joint award of $228,382 went to the *New Flora of Chile* project. The project was initiated by Chileans and centered at the University of Concepción. The Chileans invited botanists at the Garden, the Ohio State University, the University of Reading, England, and the University of Munich, Germany to collaborate on the project. Experienced botanists, recent graduates and students of all of the institutions will participate, together with collaborating specialists. Almost half of the flora of Chile is found in no other country. Rapid habitat destruction there makes the need for understanding this unusual flora urgent. The most recent floristic treatment for the country, completed in the early part of this century, is now outdated and incomplete. The *New Flora of Chile* will include a modern treatment of the vascular flora, a database of available collections, a distribution-mapping system using desktop computers, and an updated checklist compatible with the one being prepared for Argentina. It will be the first flora completed for any country in South America. Dr. Charlotte Taylor of the Garden's staff and Dr. Tod Steussy of Ohio State University are the principal investigators of the project.

Venezuela

The Flora of the Venezuelan Guayana (FVG) project received $95,000 in additional funding over two years from the NSF. The FVG is a massive collaborative project to produce a complete vascular plant flora for the southern half of Venezuela. This grant will help finish the project, begun by the late Julian Steyermark in 1983. In addition, it will help develop a database of all accepted names, synonyms and distribution of the taxa included in the FVG as a basis for the production of an updated catalog of the Venezuelan flora. The FVG project brings together over 170 scientific contributors worldwide, including Latin American botanists in Venezuela, Brazil, Colombia, Ecuador, Argentina, Paraguay and Mexico. There will be eight volumes produced in English over a three-year period, starting in late 1993. At least the first volume will also be published in Spanish.

The Venezuelan Guayana is one of the most diverse areas on earth in terms of number of species and vegetation types. By virtue of Venezuela's very low population density in the south, its petroleum-based economy, and a high level of ecological consciousness, the country is in a singular position of being able to preserve one of the largest, continuous expanses of humid, tropical ecosystems in the world well into the 21st century. It is hoped that the data included in the FVG will provide a valuable source of baseline information for developing rational land use and park management systems in the Venezuelan Guayana. Garden botanist Dr. Paul Berry is the principal investigator of the project.

Madagascar

An updated treatment of the plant family Lauraeceae, one of the most important tree families in wet forests of Madagascar, has been granted $52,000 by the National Science Foundation. Lauraceae is a rather large, predominantly tropical family of trees and shrubs of considerable economic interest. An account of the family for Madagascar was published in 1950, but more than twice the number of species will be published in this newer treatment. This will fill the needs of many people working in the forests, including botanists, anthropologists, ecologists, foresters, and zoologists. The treatment will be included in the *Flore de Madagascar*, to be published in French by the Natural History Museum in Paris. The principal investigator of the project, Dr. Henk van der Werff, expects that any number of new plant species will be discovered during the course of the project.

Arabidopsis

NSF also awarded $223,130 for Dr. Ihsan Al-Shehbaz's study of the systematics and phylogeny of *Arabidopsis*. The story appears on page 17.

CLIFF WILLIS

Ihsan Al-Shehbaz

A Landmark Study of the World's Simplest Flowering Plant

MOUSE-EAR CRESS, *Arabidopsis thaliana*, is a member of the mustard family, which also includes cabbage, Brussels sprouts, broccoli, cauliflower, water cress and radishes. It is an unprepossessing Eurasian weed found along roadsides in many parts of the world, and it is fast becoming the plant of choice for basic biochemical, developmental and genetic research worldwide.

Garden researcher Dr. Ihsan Al-Shehbaz, one of the world's leading experts on the mustard family, has received a $223,130 grant from the National Science Foundation (NSF) to conduct a basic systematic study of the genus *Arabidopsis*, which remains very poorly understood despite its wide distribution. Dr. Al-Shehbaz will conduct the study in addition to his primary work on the *Flora of China* project.

Mouse-ear cress is prized for scientific research because it possesses the simplest genome of any flowering plant, with no repetitive DNA and a very small number of chromosomes. This makes it ideal for studying fundamental biological processes, especially because the plant is also extraordinarily easy to grow in the laboratory. It has a generation time of only four to six weeks and is small enough to grow thousands of plants in a small room. It is self-fertilizing and thrives on a variety of synthetic growing media. The NSF has established a multimillion dollar goal of identifying the complete gene sequence of *Arabidopsis thaliana* by the year 2000.

"Understanding a simple organism makes it much easier to study more complex ones," Dr. Al-Shehbaz explained. "*Arabidopsis* may become a model for studying plant evolution. Yet the very basic information on the genus is almost non-existent, including its nearest relatives, number of species, and reproductive biology. Also, very little living material has been collected for study. Our project will address all of those issues, providing the scientific community with a detailed profile of the genus."

The project involves extensive field work in central Asia, the region of greatest diversity for *Arabidopsis*. Seeds collected will be deposited at the Arabidopsis Biological Resource Center at Ohio State University, where they will be made available to scientists worldwide. Dr. Al-Shehbaz is also reviewing thousands of herbarium specimens from more than 80 herbaria from all over the world, and will be collaborating with molecular biologists studying *Arabidopsis* at other institutions.

"I will need to collect in China and Tibet next year," Ihsan says. "Mouse-ear cress grows as a naturalized weed all over the world, but to find native populations we must go to central Asia, a very difficult place to travel. The field work will be concentrated in Pakistan, India, Afghanistan, Kazakhstan, Kyrgyzstan, Tajikistan and adjacent China."

Fortunately Ihsan is familiar with that part of the world. He is a 1962 graduate with highest honors from the University of Baghdad. He earned his Ph.D. from Harvard in 1973, and his published doctoral dissertation received the Garden's prestigious Greenman Award. Ihsan returned to the Middle East where he taught at various universities until 1980, when he returned to the U.S. to do postdoctoral work at Harvard. In 1990 he came to the Garden to work on the *Flora of China* project. Of his landmark work with *Arabidopsis* he says, "I am delighted to be able to help make this contribution to our basic knowledge."

CLIFF WILLIS

DIRECTOR OF SISTER GARDEN VISITS ST. LOUIS— *Dr. He Shan-an, director of the Nanjing Institute of Botany in Nanjing, one of the most important botanical institutions in China, visited the Garden in October. Dr. He also directs the Garden's sister botanical garden, Jiangsu Botanical Institute and Botanical Garden mem. Dr. Sun-yat-sen in Nanjing. St. Louis and Nanjing are sister cities. Dr. He was in St. Louis to discuss a number of collaborative research and conservation projects with the Garden and other institutions. Dr. He (left) is shown here in the Garden's herbarium with Dr. William Tai, coordinator of the Flora of China project at the Garden.*

A WALK IN THE TREETOPS—Participants in a Garden tour last year enjoyed a breathtaking view of the Amazon rain forest of Peru from an aerial footbridge, an integral part of The Amazon Center for Environmental Education & Research (ACEER). A team of Peruvian botanists under the direction of Garden curator Dr. Alwyn Gentry completed the tree survey for the canopy walkway. The Garden's Education Division plans many future trips to rain forest areas, including a trip to Belize scheduled for late July or early August, 1993. Watch upcoming Bulletins for details, or call 577-5140 for information.

New Flashcards for Teachers

"A Tropical Feast"

Hot off the presses is a set of 40 educational flashcards featuring common and unusual tropical food products. The cards picture and describe fruits, vegetables and spices grown in the tropics. Each card displays a full color photo of a plant product and lists the plant's scientific name and family, which parts are used, where it is grown, where it is native, its uses, and interesting facts about the plant.

The cards were originally developed in 1989 as a component of the Tropical Rain Forest Suitcase Science kit funded by the John D. and Catherine T. MacArthur Foundation. Suitcase Science kits provide thematic materials, ideas and curriculum designed for "hands-on" classroom activities. They have proved to be very popular with teachers. The original kits received national distribution. In 1991 additional funding provided for more kits to be assembled to meet the burgeoning demand.

According to Glenn Kopp, the Garden's instructional coordinator for adult programs who developed the flashcards, "The decision to publish the cards was a result of nationwide interest in the kits and the flashcards. Since the original kits were distributed, the Education Division has received numerous requests for the flashcards." Kopp also did the photography for the cards.

Each set of flashcards sells for $18 to Garden members and $22.50 to non-members and schools. The cards are available in the Garden Gate Shop or may be ordered directly from the Garden's Education Division. For mail orders please include $2 for postage and handling. Call (314) 577-5140 or write the Education Division, Missouri Botanical Garden, P.O. Box 299, St. Louis, Missouri 63166-0299.

Learning To Take Action

BILL HENKOFF

Anna Mracek with tee shirts and tote bags her class sold to raise money for the Children's Rain Forest.

Education classes at the Garden open students' eyes to the wonders of the natural world. They also seek to instill a sense of responsibility for preserving the Earth's environment. Ten-year-old Anna Mracek was inspired to take action by a class on tropical deforestation taught by the Garden's Henry Shaw Academy.

Anna, a student at the Ronald S. Beasley School, wrote to the Children's Rain Forest, a project of the Monteverde Conservation League of San Jose, Costa Rica. The Children's Rain Forest, or Bosque Eterno de los Nīnos, began through the efforts of nine-year-old Roland Tiensuu, a student at a small rural school in Sweden. Roland and his classmates raised enough money to purchase 15 acres of rain forest in Costa Rica; today children around the world have contributed funds to buy 14,000 acres of tropical forests for natural preservation.

With the help of teachers at the Beasley School, Anna and her fourth grade class decided to sell tee shirts and tote bags which were printed with their drawings of rain forest animals. Parents of the class also contributed the proceeds from a bake sale. The students' science studies were augmented by a study of tropical rain forests, and the school's Parents' Association voted to make the rain forest acreage the fourth grade's graduation gift to the school. It was also suggested that future fourth grade classes make an ongoing commitment to the project.

Through the efforts of Anna, her class and teachers, two acres of rain forest have been preserved in Costa Rica, and many more students are aware of critical environmental issues. For her efforts, Anna received the Amanda Shannon Johnson Science Award for best overall science student at the Beasley School in 1992.

MICHELLE DESLOGE

Christina Massey, Ruth Fetté and Laura Marchlewski in one of the greenhouses at the Garden.

Gateway High School Interns

Three seniors from the Gateway Institute of Technology, a new Magnet School in the St. Louis Public School District, are participating in a year long internship program here at the Garden. The students, Ruth Fetté, Christina Massey and Laura Marchlewski, report to the Garden every Thursday morning and spend their school day working alongside Garden staff. Ursula Rudolf, the students' supervising teacher at Gateway High School, commented that "They value this opportunity to work side by side with professionals at the Garden, learning from them while also gaining experience at such a prestigious institution."

Each student will rotate through the Herbarium, the *Flora of North America* project and the Horticulture Division, spending ten weeks in each area. They are keeping journals of their experiences and will receive three school credits for their internships.

"This program provides high school students with a unique opportunity to see first hand what the work of science entails," said Dr. Larry DeBuhr, director of Education. "We are pleased to be able to offer this valuable experience to seniors, exposing them to professional opportunities which may influence their career choices. We look forward to continuing to work with Gateway Institute of Technology as this internship program grows in the future."

The students have found their experience valuable. Ruth Fetté summed it up when she said, "I've learned such a great deal. I've met wonderful people who truly make learning fun and exciting. This has been an experience I will never forget."

—Barbara Addelson,
ECO-ACT Coordinator

Nature Center Administrators Meet

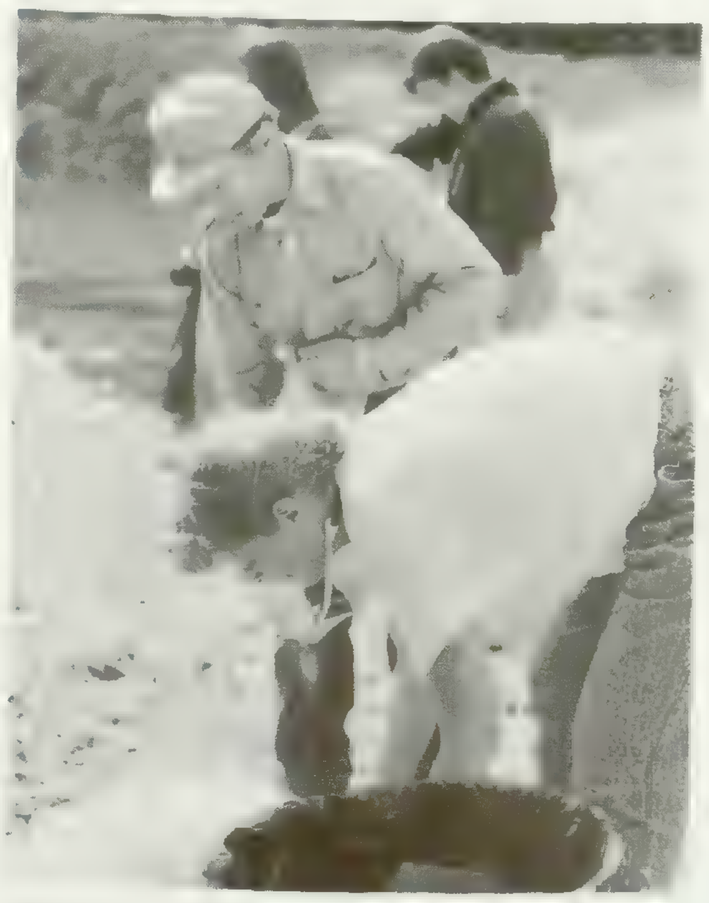
The Garden hosted a meeting of the executive committee of the Association of Nature Center Administrators in October. The group held a business meeting October 3, followed by a tour of the Garden and dinner. The following day the group conducted a seminar on outdoor environmental educations programs at the Arboretum. Staff members from the Arboretum and the Garden's Education Division participated in the seminar.

Education Division Receives Grants

The Edward Chase Garvey Memorial Foundation has awarded the Education Division at the Garden $7,000 for replacement of obsolete and worn out instructional equipment, and for the purchase of new supplies and materials that will strengthen the Division's ability to respond to increasing requests for educational programming.

The Education Division has also received $4,000 from the Joseph H. and Florence A. Roblee Foundation. This gift will help the Garden refurbish aging Suitcase Science kits. Suitcase Science kits are loaned to teachers throughout the metropolitan area. These kits are very popular, and after ten years of heavy use, many of their components need to be replaced.

Both of these wonderful gifts not only help the Garden, but also benefit thousands of children and teachers who rely on the Missouri Botanical Garden as an important educational resource in St. Louis.



Bill Davit, Maried Swapp, and members of the Education Division at work.

Creek Cleanup at Ecology Center

On a warm afternoon in October the Garden's Education Division staff combined an environmental cleanup project with a tour of the new Litzsinger Road Ecology Center. The staff assembled to see the newly renovated cabin and teaching deck and to help pick up trash that had washed into Deer Creek after seasonal floods earlier in the year.

"It is amazing what you can find along the stream after floods," says Bill Davit, site manager of the Center. "Deer Creek regularly floods in the spring and summer when rain storms are heavy. A lot of the trash carried by the floods ends up in the Center as the flood waters recede." On this day, the cleanup crew collected over ten garbage bags of trash, three tires, an old wire chair frame, and a living room carpet found rolled up and stuck in the stream bank.

The Litzsinger Road Ecology Center is an urban outdoor environmental education site that is used by the Missouri Botanical Garden to teach ecology and science to St. Louis children. In addition to the stream, the Center also has deciduous forest habitats and a ten-acre prairie that provide sites for environmental education activities.

—Jeff DePew,
Henry Shaw Academy Coordinator

From the Garden Gate Shop

Happy New Year Clearance Sale!

The Shop will hold a pre-inventory Clearance Sale beginning on New Year's Day, January 1, and continuing through Sunday, January 3, 9 a.m. to 5 p.m. Everything in the Shop will be 20 percent off for members, including merchandise specially marked down.

Closed for Inventory

The Shop will close for annual inventory Monday, January 4, and will reopen for business at 9 a.m. Wednesday, January 6.

Annual Orchid Sale

The annual Orchid Sale begins at the members' preview of the Orchid Show, Friday evening, January 15, 5 to 8 p.m. The sale continues to February 15. Members receive a 20 percent discount on orchids, plus bark, fertilizer and wire accessories.

Valentine's Day Special

Come to the Shop for the best selection of wonderful gifts for all the special people on your list. In addition to beautiful jewelry and lovely flowering plants you'll find garden accessories, books, a wide variety of charming toys and gifts, and a very special offer on the Shop's exclusive fragrance, "La Rose de Beauté." February 1 through 14 you can purchase a 1.5 ml vial with a matching sachet for $5.00, regularly a $6.50 value. This lovely floral scent is packaged in a charming folder that can double as a Valentine card.

Moving? Please Remember To Send Us Your New Address.

To avoid missing any of your membership mailings, you *must* give us your new address at least three weeks *before* you move. Please enclose the mailing label on the back cover of this *Bulletin*, and mail to: Membership Office, Missouri Botanical Garden, P.O. Box 299, St. Louis, MO 63166.

Name:_____

Old Address:

_____

City_____

State_____ Zip_____

New Address: (Date effective:_____)

_____

City_____

State_____ Zip_____

Volunteers Needed!

A number of interesting new volunteer positions are available at the Garden.

When it opens this winter the **new Conservation Center** will need a number of individuals to greet professional visitors, answer general inquiries, and assist with clerical tasks. Beginning in February, the volunteers will be asked to contribute three and a half hours per week, from 9 a.m. to 12:30 p.m. or 12:30 to 4 p.m., Monday through Friday.

The Membership Office needs volunteers immediately for three hours each week, 1 to 4 p.m., Monday, Wednesday or Friday. These individuals need good organizational, clerical and handwriting skills to help process tribute gifts. They will be dealing with staff, members and the public.

Several openings are available for each job, and training will be provided. Please call Jeanne McGilligan at 577-5187 for an application.

FROM TOWER GROVE HOUSE

Thanks to Our Volunteers

We extend our deepest appreciation to all of the organizations and individuals who helped to decorate the House for the 1992 holidays:

Members' Board, Missouri Botanical Garden
Historical Committee, Tower Grove House
Tower Grove House Auxiliary
Four Winds Garden Club
St. Louis Herb Society
The Twenty-Five Gardeners of Kirkwood
Webster Groves Garden Clubs No. 4 and 5
Joan Abeln
Tower Grove House staff
Botanicals on the Park

The spectacular Victorian holiday decorations in Tower Grove House are always one of the highlights of the season. Many thanks, one and all!

***AS A SPECIAL TRIBUTE* to family and friends at important occasions throughout the year—birthdays, anniversaries, achievements, or as expressions of sympathy—a gift to the Missouri Botanical Garden's Tribute Fund is a very personal gift. Tributes also help to keep the Garden's grounds blooming and support its programs. A personal acknowledgement is sent to the family or individual honored, without reference to the size of the gift, and your tribute is listed in the Garden's Bulletin. Your Tribute gift is fully tax deductible. You may charge your Tribute by calling (314) 577-5118.**

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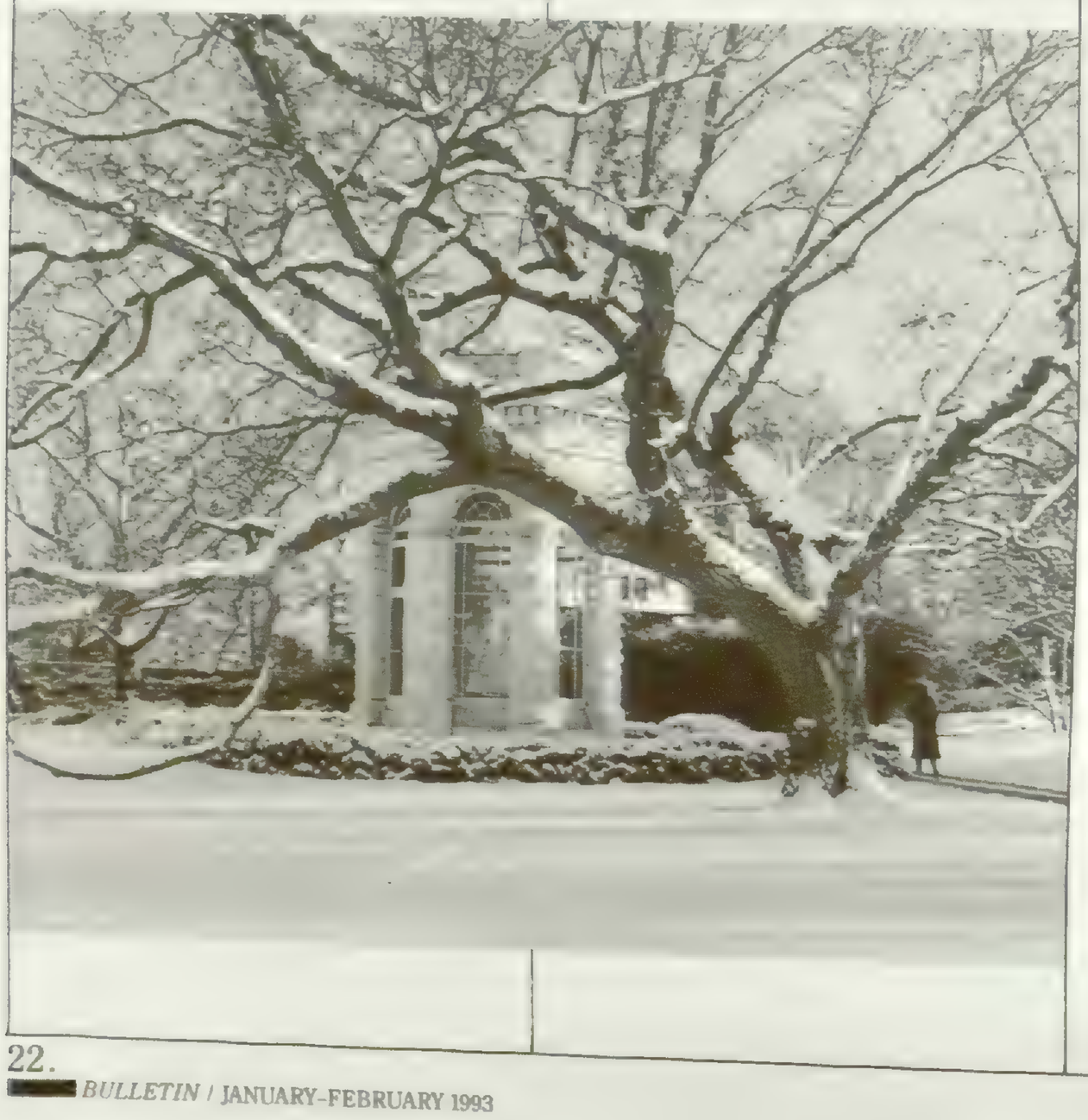

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Mr. William A. Gilbert

MICHELLE DESLOGE

New Conservation Center Set for Winter Opening

The new Conservation Center is in the final phase of construction, preparing to open this winter. The Center includes the old Park Building, completely renovated, and a new 8,340 square-foot addition on the north side. The Center will provide offices for the Horticulture Division and its volunteers, including a state-of-art facility for the Horticultural Answer Service, plus offices for the Center for Plant Conservation and the Gateway to Gardening Association. The building at the right of the picture houses the Garden's boiler facilities.

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Missouri Botanical Garden

MARCH / APRIL
1993

VOLUME LXXXI
NUMBER TWO

Comment

EARLY SPRING is always a time of intense activity for gardeners, and this year is no exception. We are absolutely delighted to be moving ahead with the Center for Home Gardening and the development of its outdoor display gardens. This is truly an exciting innovation in horticultural education, offering a living laboratory of ideas for every type of gardening interest. (Please see pages 6 and 7.)

In January we welcomed new slates of officers to the Board of Trustees and the Members' Board. The Garden has made extraordinary progress on all of its endeavors during the past two years under the splendid leadership of O. Sage Wightman III, the outgoing president, and we extend to him our deepest appreciation for his unstinting commitment of time and energy. We are delighted to welcome John K. Wallace, Jr., as the new president of the Board. John has been a devoted friend of the Garden for many years, and we look forward to continuing the Garden's progress under his guidance. And as Mary Longrais enters her second year as president of the Members' Board, we salute her for her commitment and leadership.

As you gear up for the growing season, we are sure you will find inspiration in our ever-popular Gardening by Design Lecture Series in March. Five different experts will share a wealth of ideas for you to try at home. And for your children, take a moment to consider the truly exciting opportunities for fun and learning offered by the Henry Shaw Academy Summer Science Camp (see page 20.)

As you may have noticed, with this issue of the Bulletin we introduce a new, updated design. We hope you enjoy it and find it pleasant and easy to read. And please be sure to visit the Spring Flower Show with your family and friends. It is a glorious way to get the first glimpse of the springtime blooming season just around the corner.

— Peter H. Raven, Director

The Unseen Garden

TIM PARKER

OPEN HOUSE APRIL 24 -- Members and the public will have an opportunity to see the Garden's research division in action and to visit the world famous herbarium in the John S. Lehmann Building. Learn how millions of plant specimens are dried, mounted and stored for future reference; visit the Garden's renowned botanical library; and talk with botanists about their work collecting plants all over the world.

RESEARCH DIVISION OPEN HOUSE

Moving?
Please remember to send us your new address.

To avoid missing any of your membership mailings, we need notification of your new address at least three weeks before you move. Please enclose the mailing label on the back cover of this *Bulletin* and mail to:

Name:_____

Old Address:

Street_____

City_____

State_____ Zip_____

New Address:

Date effective:_____

Street_____

City_____

State_____ Zip_____

On the Cover

Yatsuhashi Bridge in the Japanese Garden.
Photo by King Schoenfeld

Editor

Susan Wooleyhan Caine
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P. O. Box 299
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RICHARD BENKOF

New Trustees Elected

AT their Annual Meeting on January 13, 1993, the Board of Trustees elected John K. Wallace, Jr. as president, David W. Kemper as first vice president, and William H. T. Bush as second vice president. Mr. Wallace succeeds O. Sage Wightman III as president.

Mr. Wightman, a senior vice president of Stifel Asset Management Company, has served on the Board since 1983 and was elected president in January 1991. In tribute to his work as president, Mr. Wallace said, "Sage has served this institution magnificently during his tenure. He has been prudent, conscientious, know-ledgeable and available to provide the necessary leadership for the Board and the institution. It is with a sincere sense of gratitude that I assume this responsibility."

Mr. Wallace went on to enumerate some of the accomplishments of Mr. Wightman's term as president: maintaining financial strength and stability, enabling the Garden's programs to continue to serve the public well; tremendous growth in the research program; increases in the number of volunteers and in almost all services provided by the Garden; welcoming the 30,000th family member in May 1992; opening the William T. Kemper Center for Home Gardening in June 1991; welcoming the Center for Plant Conservation, which established its headquarters at the Garden during 1991; establishing a Cultural Diversity Council at the Garden; awarding the first Ernest E. Just Scholarship to inspire and support African-American students to pursue degrees in science; building the new Conservation Center; working with the Litzsinger Road Ecology Foundation to develop the Litzsinger Road Ecology Center for outdoor science education programs; establishing HortLine, a 24-hour information gardening service for the public; and overseeing the expansion of all the Garden's public programs and services.

Above, from left: John K. Wallace, Jr., O. Sage Wightman III, Peter H. Raven.

The Board of Trustees presented Mr. Wightman with an original botanical painting by George Olson, who was artist-in-residence at the Garden last fall. Mr. Wightman said, "It has been a tremendous pleasure for me to serve as president, and I look forward to working with John and the Board to help the Garden continue to grow as a world class institution."

John K. Wallace joined the Board in 1982. He became interested in the Garden during the 1980 capital campaign for the Ridgway Center and has worked tirelessly to further the growth and expansion of Garden programs ever since. A native St. Louisan, he retired recently as chairman and chief executive officer of Imperial Products Corporation.

"The Garden is entering a very challenging era," Mr. Wallace observed. "In the near future we plan to make major investments in facilities and programs that will take the Garden's international leadership in research, education and display into the 21st century. I feel extremely honored to assume the presidency of the Board at this time, and I look forward to working with Trustees, staff and community leaders to make an excellent institution even better."

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MISSOURI BOTANICAL
MAR 10 1993
GARDEN LIBRARY

Trustees *continued*

Peter H. Raven, director of the Garden, said, "One of our institution's greatest strengths is the caliber of the individuals who volunteer their time, energy and resources to help the Garden grow and prosper. It has been a pleasure and a privilege to work with Sage Wightman, who has done a superb job during one of the busiest times of Garden expansion, and I am glad that he will remain on the Board and continue to give us the benefit of his counsel. I am looking forward to working with John Wallace and the rest of the Board as we face our upcoming challenges."

Also elected at the annual meeting were two new Trustees, Carolyn W. Losos and The Honorable Carol E. Jackson. Each was elected for a two-year term. Board members Charles F. Knight and Lucius B. Morse III were elected Life Trustees, and Robert R. Hermann and William R. Orthwein, Jr. were named Emeritus Trustees. Prof. Philippe Morat was re-elected to a two-year term as Honorary Trustee, and Dr. Robert Ornduff was elected to a four-year term as Honorary Trustee, succeeding Dr. Mildred Mathias (see p. 5).

New Episcopal Bishop Joins Board

IN A CEREMONY on Thursday, January 21, 1993, at Christ Church Cathedral in St. Louis, the Rt. Rev. Hays Hamilton Rockwell was installed as the Ninth Bishop of the Episcopal Diocese of Missouri, succeeding retiring Bishop William A. Jones, Jr. In his Will, Henry Shaw, founder of the Missouri Botanical Garden, specified that certain individuals should serve on the Garden's Board of Trustees "by virtue of their office," including the Bishop of the Episcopal Church. With his installation, Bishop Rockwell became a member of the Garden's Board.

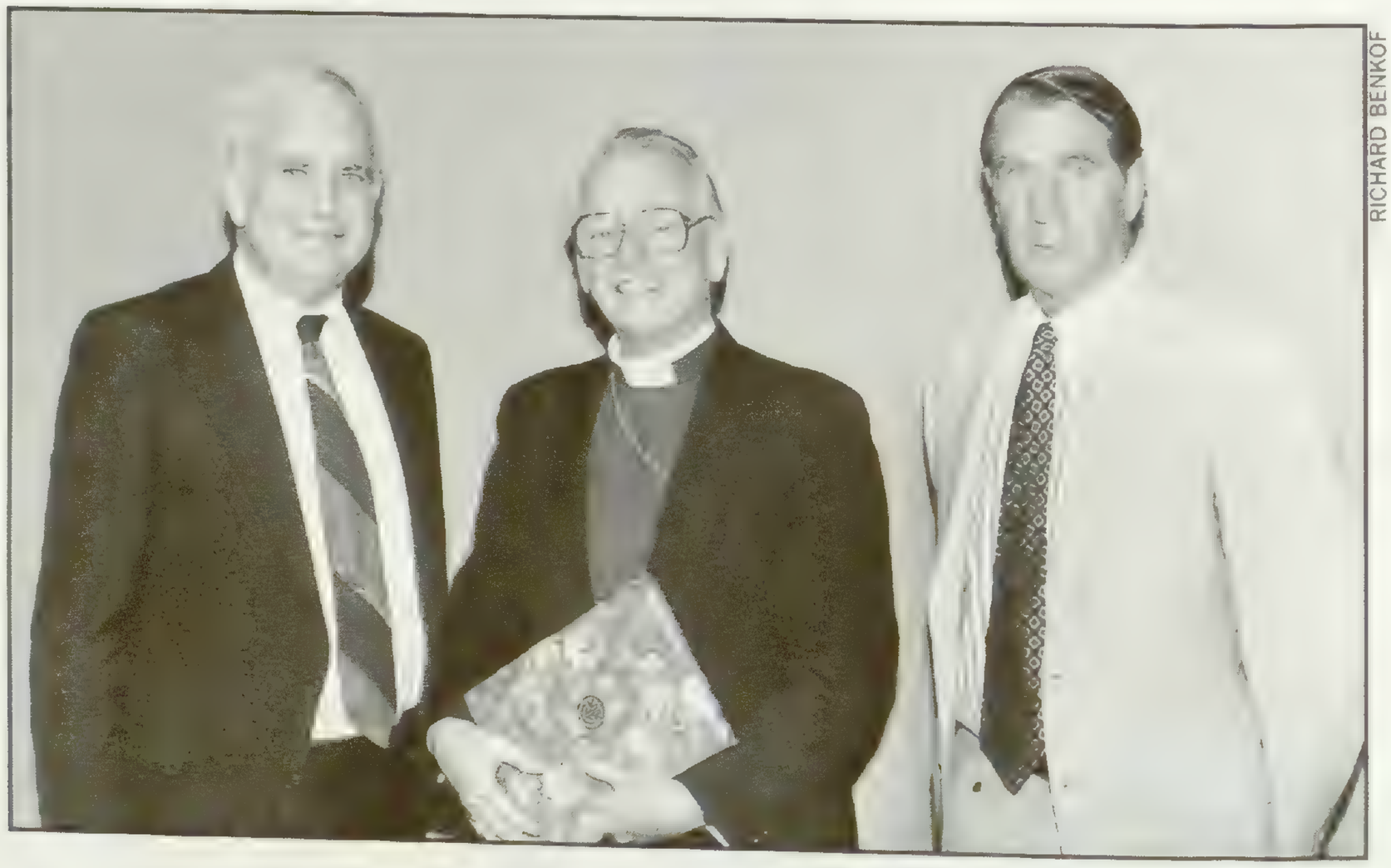
Bishop Jones had been a valued member of the Garden's Board since he was consecrated as Eighth Bishop of Missouri on May 3, 1975. He has been on sabbatical leave in England since last June, where he will continue as assistant to the vicar at St. Margaret's, Rainham, near London, until next August. Bishop Jones was serving as rector of St. John's Church in Johnson City, Tennessee, when he was elected Bishop of Missouri.

Peter H. Raven, director of the Garden, said, "Bishop Jones made a wonderful contribution to the Missouri Botanical Garden during the many years he served as a Trustee. He always understood the

continued on next page

MARILYN ZIMMERMAN

Right: The Rt. Rev. Hays Hamilton Rockwell, Ninth Episcopal Bishop of Missouri



RICHARD BENKOF

At right: At the June, 1992, meeting of the Garden's Board, the Trustees honored Bishop Jones for his eighteen years of service to the Garden. From left: Peter H. Raven, Bishop Jones, O. Sage Wightman III.

Bishop *continued*

mission of our institution and believed in its essential moral integrity. We held his service to the Garden in the highest esteem and we will always be deeply grateful for his friendship."

Bishop Jones spoke with enthusiasm of his work with the Garden. "The most exciting thing was the continual expansion of my horizons on the importance of environmental issues. Through celebrations such as Flower Sunday (see story below) and work with the Episcopal Environmental Coalition I have been privieged to share with others the knowledge I gained at the Garden, that environmental concerns are of deep spiritual significance for us all. Serving on the Garden's Board of Trustees was a wonderful experience and I always received far more than I gave."

In honor of Bishop Jones' outstanding service to the Garden, the Episcopal Diocese of Missouri made a gift to support the purchase of a beautifully illustrated 25-volume book on the medicinal herbs of China for the Garden's library. In addition, the Episcopal Church Women of the Diocese of Missouri gave a tribute to the Garden in honor of Margaret Jones, wife of Bishop Jones, of a double white flowering *Camellia japonica* 'Noblissima' located at the east end of the Linnean House. The Garden is deeply grateful for both of these magnificent gifts.

Bishop Rockwell was elected Bishop Coadjutor in October 1990 to succeed Bishop Jones on his retirement and was consecrated March 2, 1991. A native of Detroit, Bishop Rockwell received a master's degree from The Episcopal Theological School in Cambridge, Massachusetts, following his graduation from Brown University. He was ordained to the priesthood in 1962 and studied at Oriel College, Oxford University, England, 1966 to 1967. He came to Missouri from St. James' Church in New York City, where he had been rector since 1976.

Upon becoming a member of the Board, Bishop Rockwell said, "Mrs. Rockwell and I are grateful for the warm welcome we have received at the Garden and in St. Louis, and I am looking forward with eagerness to working with the Board and with Peter Raven in the months and years ahead."

New Honorary Trustee Named

In his Will, Henry Shaw created two positions on the Board for Honorary Trustees, who were to be selected for their scientific eminence. The individuals selected by Shaw predeceased him, and the positions were never filled until the Board's centennial year, 1989, when Prof. Philippe Morat and Dr. Mildred E. Mathias were elected to four-year terms. At the Annual Meeting of the Board on January 13, 1993, the Board elected Prof. Morat to a second two-year term and elected Dr. Robert Ornduff to succeed Dr. Mathias. —Editor

ROBERT ORNDUFF, recently retired professor of botany at the University of California, Berkeley, is an outstanding scientist and a champion of horticulture and conservation. Born in Portland, Oregon, in 1932, he received his B.A. from Reed College, M.S. from University of Washington, and Ph.D. from the University of California, Berkeley. He was director of the Jepson Herbarium and Library from 1968 to 1982, and director of the U.C. Botanical Garden from 1973 to 1991.

The Botanical Garden, a jewel of a garden set high in the hills above the U.C. campus, has one of the richest and most interesting plant collections of any garden, all plants of known origin. During Ornduff's tenure as director, many areas of the Garden itself were developed, a Friends group flourished, and education programs were established that have become a major part of the activities at the Garden.

Ornduff is an authority on the plants of California. He is a noted plant taxonomist and has done pioneering work on the evolution of breeding systems in plants, studying such diverse groups as *Lasthenia* (goldfields) in California, and *Cycas* (cycads) in Australia. Many plant taxonomists now in academic and botanical garden positions, including MBG assistant director Nancy Morin, completed their Ph.D.'s under Ornduff's direction. "It will be a real pleasure to work with Dr. Ornduff in his role as Honorary Trustee and to be able to benefit from his depth of botanical garden knowledge and expertise," said Morin.

Flower Festival Is April 24 and 25

Henry Shaw's 104-year-old legacy to the Episcopal Diocese of Missouri will continue with the 1993 Flower Festival at Christ Church Cathedral, 13th and Locust in St. Louis, April 24-25.

In his Will, Henry Shaw provided specifically for an annual sermon to be delivered, under the guidance of the Bishop of the Episcopal Church of the Missouri diocese, on "the wisdom and goodness of God as shown in the growth of the flowers, fruits and other products of the vegetable kingdom." Known affectionately for many years as Flower Sunday, the event has become a Flower Festival Weekend. In memory of Henry Shaw, the Garden annually donates more than 1,000 plants to decorate the Cathedral for the event. This year the theme of the Festival is "Youth" and the funds generated by the Festival will benefit the Gateway to Gardening Association's Youth Projects and the Youth Development Programs of the Diocese.

The Festival features a street fair on Saturday, followed by the "Flower Sermon" on Sunday at the 11 a.m. service. This year the Flower Sermon will be delivered by the Rt. Rev. Peter Beckwith, Bishop of Springfield. The floral decorations in the Cathedral may be viewed by visitors free of charge from 10 a.m. to 2 p.m. through Monday, April 27. All members of the Garden and their friends are urged to visit Christ Church Cathedral during the celebration.

Gardens

In June, 1991, an exciting new facility was dedicated on the grounds of the Missouri Botanical Garden: the William T. Kemper Center for Home Gardening, named through the generosity of the William T. Kemper Foundation, Commerce Bank, Trustee. The Garden is now planning to move ahead with the addition of 23 residentially scaled demonstration gardens to surround the education building. In this and coming issues, we will describe the gardens, both those already sponsored and those still open for donation. Members interested in learning more about sponsorship may call the Garden's Development Office at (314) 577-5120.

Experimental Garden Is Donated

When Audrey and John Steinfeld wanted to find a unique and beautiful way to memorialize her parents, Rose J. and Justin A. Naumann, they naturally thought of the Missouri Botanical Garden. The Steinfelds are avid gardeners and have been members of the Garden for more than 20 years.

About ten years ago, they moved to a home on a 3.75-acre lot just so they could garden on a scale fitting their dreams. With Audrey in charge of herbs, perennials and annuals and John handling the vegetables, trees and shrubs, they like to think of their place as a "miniature Shaw's Garden."

The Steinfelds selected the Experimental Garden for their tribute to the Naumanns. In this garden, colorful, attractive new varieties of flowers, vegetables and fruits will be rigorously evaluated for regional suitability and appropriate growing techniques. "The Experimental Garden distills and exemplifies our institution's historic role in building information on the finest new offerings in horticulture", explained the Garden's director, Dr. Peter H. Raven. "Audrey and John have our deepest thanks for their support in making it possible."

Entering the Experimental Garden by way of a cedar pergola, the visitor will find a series of test plots and borders. Movable exposed-aggregate pavers will allow staff to create plots of flexible size designed to achieve each test period's best layouts, for purposes of both aesthetics and evaluation. Farther along, cordons will support new varieties of blackberries and raspberries, and fruit trees will edge a path at the garden's south end. An ornamental arch with seating shaded by grapevines will invite visitors to linger and learn.

In explaining their choice, Audrey said with a laugh, "We thought that, since we've all been experimenting as amateurs for all these years, this garden was especially appropriate. People will profit so much -- it will cut down on experimenting!"

John summed up their feelings with, "As amateur gardeners, we are excited and very delighted to be able to participate in such a magnificent project. It is an honor to have the memory of Rose and Justin live on inside the magnificent Shaw's Garden."

RICHARD BENKOF

John and Audrey Steinfeld (at left) with Peter H. Raven and a rendering of the Experimental Garden.

Future Gardens

Native Shade Garden
A shady path meanders through a garden-sized plot of eastern Missouri woodland. A canopy of sugar maples, white oaks and butternut hickories tower over flowering dogwood, sassafras, serviceberry and spice bush. On the woodland floor delicate, shade-loving native species of wildflowers, including bloodroot, Dutchmen's breeches and Virginia bluebells add color, texture, and pattern as they sprout among tree trunks and large limestone boulders. A rough hewn oak bench in a shady alcove of cedars provides a peaceful resting place.

City Garden
A small urban lot can unite indoors and outdoors to maximize growing space and provide a green oasis. This garden includes a six-foot brick perimeter wall, a vine-covered cedar arbor, a cedar trellis and a small bubbling pool where an ornamental bronze otter plays amid water lilies and irises. An ornamental tree casts dappled shade onto an intimate seating area. Borders of mixed shrubs, perennials, annuals, herbs and ornamental grasses mingle with beds of high yield vegetables bordered by an herb hedge. Climbing vegetables, vines, espaliers and hanging pots and baskets add vertical interest.

Lawn and Flower Borders
Flower borders encircle the Kemper Center's expansive central lawn, making use of the full range of flowering shrubs, perennials and annuals. Single and multi-color groupings, seasonal borders, fragrant plants, cutting plants and low maintenance combinations are featured. A long, semi-circular cedar pergola, planted in vines and hung with colorful seasonal baskets, serves as a backdrop and provides cool shade on hot summer days.

DEMONSTRATION GARDENS planned for the Kemper Center for Home Gardening:

Agronomic Garden
Apple Allee
Backyard Garden
Bird Garden
Butterfly Meadow
Children's Garden
City Garden
Entry Court
Experimental Garden
Fruit Garden
Garden for All Seasons
Garden for a Family of Four
Groundcover Display
Lath House
Lawn and Flower Borders
Limestone Glade
Native Shade Garden
Overlook Garden
Ornamental Vegetable and Flower Gardens
Prairie Garden
Rock Garden
Rotating Display
Secret Garden
Terrace Garden

Home Gardening

HEDGES AND SCREENS: THE LIVING FENCE

WHEN SPRING ARRIVES and the sun is out, the universal itch to get out there and dig comes over all of us gardeners. This year, consider relieving your compulsion by adding a living fence to your property.

Both structural and living fences will do the job of reducing noise, diverting winds, keeping the neighbor's dog *out* and your kids *in*, but a living fence will have several additional advantages.

First, a living fence will cool outdoor spaces in summer with its shade and moisture. In addition, living fences are more effective windbreaks, blocking cold winter winds and hot summer breezes. They direct air flow over buildings, reduce heating and cooling costs, and channel breezes toward open windows, air conditioners and outdoor living spaces. Neighbors usually do not object to a living fence, and city ordinances do not typically restrict their height. But the single best reason for a living fence is the beauty it adds to the landscape.

Hedge or Screen?

What is the difference between a screen and a hedge? A living screen hides something and usually is over six feet high. Because of their height, screens are not usually extensively shaped by pruning. Their basic shape is determined by the growth habit of the plants, so choosing the right species is critical.

A hedge frequently brings to mind the vision of constant pruning and shaping. Typically a hedge bears leaves from ground up or nearly so, which may not necessarily be true of a screen. Plants that make good hedges should respond well to pruning by having a vigorous capacity to regenerate multiple new shoots from clipped ends.

Formal manicured hedges are very popular in St. Louis, but maintaining a tall, thin hedge is difficult in our climate. Problems include lack of pene-trating light, water stress, increased pest pressure, more leaf diseases, and the difficulty of replacing dead plants in a manicured hedge row with matching plants. As an alter-native, I strongly urge that you consider an unclipped hedge.

The unclipped hedge provides suitable screening with low maintenance. It may be slightly less formal in appearance, but the plants will be healthier and live longer.

Evergreens

In selecting plants for a hedge or screen, first consider their function. Some of the best plants for a screen are evergreen trees like pines, spruces and hemlocks. When planting, give these plenty of space to develop fully. You will need to be patient because they are slow to reach mature form. Generally, these plants are not good choices for a clipped hedge, although interesting formal hedges have been made from topped hemlock, which has a better ability to fill in once sheared.

To create a screen more quickly, plant upright shrubs. You may wish to double the row to create a better effect. Upright forms of Chinese juniper, *Juniperus chinensis* 'Keteleeri' and 'Hetz Columnar', eastern redcedar, *Juniperus virginiana* 'Canaertii', arborvitae, *Thuja occidentalis*, also known as white cedar, all make good tall hedges from eight to 20 feet or taller and are typically very resistant to dry conditions. You could also include American holly, *Ilex opaca*, Foster holly, *Ilex* X *attenuata* 'Fosteri', hemlock, *Tsuga canadensis*, upright Japanese yew, *Taxus cuspidata* 'capitata', and Anglojap yew, *T.* X *media* 'Hicksii'.

For mid-size hedges growing up to six feet, a number of boxwoods will do well here despite their reputation for not being hardy. Boxwoods are exacting plants; you must prepare a good planting site and expect them to grow slowly. Our St. Louis Boxwood Society has specific recommendations on varieties and sources.

Buxus sempervirens 'Varder Valley' is frequently recommended in this area. However, it is more spreading than upright, and while it makes a good hedge, it would not make a suitable screen. Better choices for medium hedges under six feet high include *Buxus sempervirens* 'Inglis', 'Welleri', 'Winter Beauty' and 'Wintergreen'. The taller *B. microphylla* 'Curley Locks' or *B. microphylla* var. sinica reach six feet.

For evergreen hedges over six feet, consider blue girl holly, *Ilex* X *meservae* 'Blue Girl' or arborvitae, *Thuja occidentalis* 'Holmstrup' and 'Sunkist'. For smaller hedges under three feet, you might try *Thuja occidentalis* 'Hetz-Midget' or 'Little Gem'. All will respond well to being pruned and shaped.

Deciduous Plants

If you decide to plant a deciduous hedge or screen, the selection is quite large. You can consider summer and autumn foliage color, flower production, fragrance and even whether it is important to create an impenetrable barrier by using plants with thorns.

Trees and multi-stemmed shrubs to be used as tall screens might include European hornbeam, *Carpinus betulus*, Callery Pear, *Pyrus calleryana* 'Aristocrat', fastigate European beech, *Fagus sylvatica* 'dawyckii', Washington hawthorn, *Crataegus phaenopyrum*, and cockspur hawthorn, *C. crusgalli*. Hawthorns have a reputation for being suceptible to rust. It never kills the plant but it does seem to worry most people. Other good choices for tall hedges and screens include hedge maple, *Acer campestre*, amur maple, *Acer ginnala*, and bald cypress, *Taxodium distichum*. The maples produce brillant yellow fall color and respond well to clipping, ma-king them usable for medium hedges. Bald cypress is a more unusual selection, but there are some good examples where this plant has been shaped into a very interesting deciduous conifer hedge or tall screen.

Plant choices for medium-sized hedges and screens, four to eight feet, are considerable. In this category you see a lot of common yews lined along foundations and walkways. This is such an overused plant, and very often it is planted in the wrong place, where it is wet. Winged euonymus, *Euonymus alatus*, is also somewhat overused, but its spectacular fall color makes this forgivable. If you are interested in plants with purple coloration, try Japanese barberry, *Berberis thunbergii*. Not recommended as a hedge, pyracantha, *Pyracantha koidzumii*, makes a wonderful screen and is the most widely used plant is the southeast.

Other good choices for

flowering hedges include Japanese quince, *Chaenomeles japonica*, hedge cotoneaster, *Cotoneaster lucidus*, amur privet, *Ligustrum amurense*, Ibolium privit, *Ligustrum* X *ibolium*, arrowwood viburnam, *Viburnam dentatum*, and Oneida viburnam, *Viburnam oneida*. All of these will serve as an unclipped or clipped hedge.

Shade

Shaded areas present the biggest challenge in plant selection. Most plants do not require shade, they simply tolerate more or less of it. If a full sun plant gets placed into considerable shade, you could expect less flowering, fruit production and overall growth. Very few trees will tolerate full shade like the evergreen, Canadian hemlock. Arborvitae also will adapt. Chinese juniper, *Juniperus chinensis* 'keteleeri', is somewhat shade tolerant, but they tend to thin out over time.

For areas receiving shade where you need a tall screen, choose a multi-stemmed deciduous shrub. My personal favorite, which is not commonly used, is sweetshrub, *Calycanthus floridus*. Otherwise named Carolina allspice, it makes a splendid unclipped, informal hedge, has fragrant flowers and does well in the shade. Other flowering favorites include mockorange, *Philadelphus* sp., glossy albelia, *Albelia* X *grandiflora*, Fothergilla, *F. major*, winterberry, *Ilex verticillata*, semi-evergreen leatherleaf viburnam, *Viburnam rhytidiophyllum* and lantanaphyllum viburnam, *V.* X *rhytidiophylliodes*.

Pruning

Pruning and training a hedge is fairly easy if you start early. The biggest mistakes are getting a late start on corrective pruning to shape the hedge, incorrect shaping, shearing instead of pruning and doing these at the wrong time of year. Sounds complex, but it is very simple. Evergreens should not be pruned in the first couple of years. In the third year, lightly prune branch tips to shape each plant, just enough to keep it together as a continuous hedge.

For deciduous plantings observe the following rules. First, just after planting in the spring, start the training process by taking out all dead branches and cutting the rest back to within six or eight inches of the soil line. This stimulates low branches and forms the framework for the hedge.

Next, in the fall or dormant season before bud break, prune off half of the first season's growth. Do this again in the fall of the second growing season to encourage more branching.

At the end of the third season, begin shaping into a hedge. There are several shapes to chose from: round, square, triangular, etc. The rule of shaping is to keep the base wider than the top with a slightly rounded peak. If this is not done, less light reaches the interior and base resulting in a slow but guaranteed death of lower branches. The second rule is to throw away the electric shears. More plants are ruined and disfigured with these! Use the pruners or scissor hedge shears.

When is the right time to prune? For evergreens, do your work in late June to mid-July. This is about the time when new growth has stopped and cut ends will heal over quickly. Timing will vary, depending on how fast the plants grow. Once they have put on one foot of growth, begin pruning. For hedges that produce flowers on last year's growth, including honeysuckle, mockorange, rose, viburnam, Japanese quince and forsythia, prune after flowering is completed. Do not remove all of the current season's growth, as it is the source of next year's flowers. For plants that flower on the current year's growth, such as albelia, some spirea, roses and hydrangeas, prune in the fall or early spring before growth begins to catch last year's growth, then repeat to shape the current season's growth. Avoid pruning late in the season before dormancy.

A good living fence is a masterpiece that will make you much more proud than wooden planks, cement walls and landscape timbers.

--Steven D. Cline, Ph.D.
Manager, Kemper Center for Home Gardening

TELEPHONE HELP

The Garden has several telephone services available to assist you.

GardenLine **577-9400**
24-Hour recorded information about Garden events, hours, admission and directions.

Outside area code 314, call **1-800-642-8842** toll free, 24 hours a day.

Horticultural Answer Service (314)577-5143
Monday through Saturday, 9:00 a.m. to noon. Master Gardeners are on hand to answer your gardening questions. The Answer Service does not have Saturday hours November through February.

TIP: The Answer Service receives thousands of calls every year and often the phone lines are busy. Please don't give up! Better yet, call on Saturday morning. Chip Tynan, head of the Answer Service, says that is the best time to get through quickly.

HortLine **(314) 776-5522**
24-hour recorded gardening information is available with a touch tone telephone. You will need a brochure listing the hundreds of HortLine topics in order to use the service; you may request a brochure by calling the Kemper Center for Home Gardening at (314) 577-9440, 10 a.m. to 4 p.m. daily.

Master Composter Hotline (314) 577-9555
9 a.m. to noon, Monday through Friday. Specially trained Master Gardeners are on hand to answer your questions about yard waste management techniques. After hours leave a message and your call will be returned. The Master Composter program is supported by the Monsanto Fund.

Kemper Center for Home Gardening

Open 10 a.m. to 4 p.m. daily.

The Plant Doctor is available 10 a.m. to noon and 1 to 3 p.m. Monday through Saturday.

Admission to the Kemper Center is free with regular Garden admission.

FROM THE

ANSWER SERVICE

Why doesn't my shrub hydrangea bloom?

Invariably, this question refers to the bigleaf hydrangea, *Hydrangea macrophylla*, whose large globe-shaped flowers appear in late summer in shades of pink or blue, depending on the pH of the soil. Acidic soil yields the richest blue.

In spite of its popularity, most cultivars of bigleaf hydrangea are not reliably hardy in the St. Louis area. Their roots survive to push up vigorous new shoots each spring, but the tops are often killed by frost. Therein lies the problem, since the flowers of this species arise from the previous year's growth.

Besides winter injury, the other major cause of failure to bloom is improper pruning. In an effort to tidy up, many gardeners prune their plants to the ground in fall or spring, unwittingly removing potential blooms. Fall pruning should be limited to just the removal of stems that bore flowers. These can be pruned at ground level. If no flowering occurred, no pruning should be done. Spring pruning should consist only of cutting back winter injured stems to sound wood and thinning out any spindly shoots. A protective mulch will improve hydrangeas' chances of survival in harsh winters. The cultivars 'Nikko Blue' and 'All Summer Beauty' are hardier than most bigleaf hydrangeas and can set flowers on current growth.

Other hydrangeas

While the bigleaf hydrangea is the most troublesome, it is by no means the only shrub hydrangea for St. Louis gardens. The smooth hydrangea, *Hydrangea arborescens*, a Missouri native, is often found in the wild along stream banks amd also occurs on wooded slopes and rocky bluffs. The cultivars 'Annabelle' and 'Grandiflora', which is also known as Hills of Snow, are superior garden plants, with large rounded white flowers that appear in early summer. Smooth hydrangea blooms on new growth and can be pruned in late winter or early spring.

The panicle hydrangea, *Hydrangea paniculata*, also blooms on new growth and may be pruned hard before growth begins. The variety 'Grandiflora' is called the "PG" hydrangea. Its white, rounded flowers bloom in mid-summer. The PG hydrangea can be grown as a multi-stemmed shrub but it is often pruned to a single trunk and trained into a tree form. The variety 'Tardiva' has a more upright pyramidal inflorescence. Blooming in late summer and remaining effective for many weeks, this cultivar is unquestionably one of the finest shrubs of its season. You can see many fine specimens at the Garden, blooming in the Hosta and Jenkins Daylily Gardens.

Last, but not least, is the oakleaf hydrangea, *Hydrangea querafolia*. This species is native to the southeastern U.S. It has large, white, upright, pyramidal flower clusters that appear in early summer. This species sets its flower buds during the previous summer, and any pruning should be done immediately after flowering. Just the same, buds are sometimes lost during severe winter weather. The oakleaf hydrangea requires minimal pruning to remove dead wood and is best left to its own devices.

All hydrangeas perform well in soils rich with humus with good drainage and partial shade, but the bigleaf and PG hydrangeas flower best in full sun.

When should the mulch be removed from roses in the spring?

In a normal year in St. Louis it is usually safe to begin uncovering the roses by the end of March. It is important not to start this task too soon. Much of the injury to roses that is attributed to winter cold often happens in late winter or early spring when temperatures fluctuate widely. Extended spells of mild weather in early spring may cause buds to swell or even break into leaves. A series of freezes beginning in mid-March last year caused extensive injury to uncovered rosebushes that had broken their dormancy as a result of unseasonably warm weather in St. Louis during the preceding weeks. The old admonition "haste makes waste" is one to keep in mind regarding spring rose care.

When you are ready, remove mulch gradually over a period of about ten days. It is important not to uncover roses all at once. In many years tender new shoots will have sprouted within the protective mulch. These shoots are extremely brittle and are easily injured by direct sun or snapped off by gusty winds. Using a gentle stream of water, wash the mulch from around the young shoots to avoid unnecessary injury. Uncovering should be complete by about April 10 to 15.

Pruning roses is pretty straightforward. The object is to remove all dead and discolored canes, as well as any spindly canes and those that grow inward toward the center of the bush or rub on one another.

Start with dead or discolored canes. These will be black or brown and shriveled through. Also remove any weak canes thinner than a pencil. If two canes cross and rub, remove the one that grows toward the center of the bush. This maintains good air circulation through the plant. All pruning cuts should be made at an angle about one-quarter inch above an outward facing bud. The angle of the cut should be sloped away from the bud. To ward off cane borers, many rosarians seal the ends of pruning cuts with a dab of white glue, orange shellac or clear nail polish. The end result of the process should be an open-centered bush consisting of four or five sturdy canes.

When pruning is complete, floribunda roses should stand about six to ten inches high, hybrid teas, about eight to 12 inches high and grandifloras 12 to 14 inches. Climbing roses should not be pruned in spring except to remove dead wood.

--Chip Tynan
Horticultural Answer Service

Call the Horticultural Answer service 9 a.m. to noon, Monday through Saturday, at 577-5143.

A landmark project makes St. Louis a major resource in the West for studying Chinese plants

PHOTOGRAPHS BY DAVID BRUNNER

Chinese Plants *Come to the Garden*

LAST FALL, GARDEN RESEARCHERS David Brunner and Nancy Tai were in China for six weeks, working with several Chinese botanical institutions to begin the preparation of thousands of mounted herbarium specimens for shipment to the Missouri Botanical Garden. The acquisition of these plants represents the first time since the 1930s that any significant numbers of Chinese plants have been made available to the West.

The project eventually will add about half a million Chinese herbarium specimens to the Garden's collection, making St. Louis a major resource for studying these plants outside China. Worldwide only a few herbaria, including those in China, will have larger collections of Chinese plants.

There are about 30,000 species of vascular plants in China; 7,000 are of horticultural importance and nearly 5,000 are used for medicines, a fact of increasing interest to western researchers and pharmaceutical companies. For example, *Trichosanthes kirilowii*, a member of the gourd family found only in China, is being studied for its strong activity against the HIV virus. In addition, the Chinese populations of *Artemisia annua*, a member of the sunflower family, show great promise against the drug-resistant *Plasmodium falciparum* malaria.

Acquiring Chinese herbarium specimens was made possible by the *Flora of China* project. In 1988 the Garden, together with Harvard University and the California Academy of Sciences, signed a landmark collaborative agreement with the Chinese Academy of Sciences (Botanical Institutes of Beijing, Guangzhou, Kunming, and Nanjing) to produce for the first time an English language flora of China. Chinese scientists have been working since 1959 on the production of *Flora Reipublicae Popularis Sinicae*, a monumental work in Chinese. Three years ago Dr. William Tai, co-director of the *Flora of China* project and curator at the Garden, began discussions about acquiring plant specimens with the South China Institute of Botany.

The sheer size of the acquisition will make enormous demands on the Garden's herbarium staff and facilities. The average herbarium has about 100,000 plants in its collection. The Garden's herbarium currently contains over 4.1 million mounted specimens and adds about 15,000 each month. The Chinese plants will arrive at the rate of about 10,000 per month and will be incorporated into the herbarium in addition to the normal workload.

"This is truly an exciting development," said Brunner, the Garden's herbarium collections manager and supervisor. "Nancy and I finalized arrangements for obtaining 100,000 duplicates from the Botanical Institute in Guangzhou. These are historical collections from the 1930s. We also visited Kunming, Beijing and Nanjing to negotiate for additional plants. During our trip we made arrangements to obtain about 300,000 herbarium specimens; future negotiations with other Chinese botanical institutions may bring the total acquisition to about 600,000."

"We also trained the Chinese in our methods of plant mounting," David continued. "The way a dried plant is mounted has an enormous impact on its longevity and its scientific value. Fortunately Nancy, who grew up in China, speaks most major Chinese dialects, which is comparable to speaking several different languages! Nancy had spent months studying plant mounting techniques, and with the assistance of Gigi Hill, the Garden's head plant mounter, we had made a video to leave behind."

The Garden's herbarium storage facilities are already rapidly approaching capacity. The addition of the Chinese plants poses an additional challenge. "We are very pleased to be able to make these enormously important plants accessible to western scientists," said Dr. Peter H. Raven, the Garden's director. "As we seek to expand our research facilities in the coming years, the significance of these plants will add to the urgency of our task."

Above: A plant mounter works in the herbarium in Beijing.

Left: Chinese botanists consult specimens at the Beijimg Institute of Botany.

Calendar

LECTURE SERIES

five tuesdays in march

Gardening by Design

Join noted experts for a look at the best in landscape design and gardening techniques. Tickets are available by subscription for $20 / members, $24 / non-members. Single tickets are available at the door, only if the series is not sold out: $5 / members, $6 / non-members. Afternoon and evening tickets may not be mixed in a subscription. See the brochure mailed to members, or call (314) 577-5125.

march 2 tuesday

Gardening by Design: "Pruning Horrors"

1 and 7 p.m., Shoenberg Auditorium. Cass Turnbull, a certified arborist, author and founder of Plant Amnesty, presents an entertaining look at the difference between pruning art and botanical butchery. Discover the beauty of pruning artistry including topiary, Japanese cloud pruning and pollarding. *See highlight for details.*

march 9 tuesday

Gardening by Design: "Revolution in the Vegetable Garden"

1 and 7 p.m., Shoenberg Auditorium. Discover the newest ideas in edible produce, including cinnamon basil, yellow tomatoes, purple potatoes, and even edible flowers. Join Rosalind Creasy, author of *Cooking from the Garden*, on a visit to America's finest restaurants and learn from the chefs how to prepare treasures from the garden, including tomato tarts, rose petal honey, and red, white and blue potato salad. *See highlight for details.*

march 12 friday

Members' Preview Spring Flower Show

5 to 8 p.m., Ridgway Center. Contemplate the quiet beauty of "Springtime in a Japanese Garden." Entertainment, cash bar. Dinner buffet is available in the Gardenview Restaurant. Free, for members only. *See back cover.*

march 13 saturday

Ernst Haas Photography Exhibit

9 a.m. to 5 p.m. daily through April 18, Ridgway Center. The Garden's private collection of works by the late world renowned photographer Ernst Haas. Free with regular Garden admission.

New!
Free Walking Tours Every Day

1 p.m. daily throughout the spring and summer. Meet the Garden Guides at the Ridgway Center ticket counter for a fascinating tour of the Garden grounds. Guides are knowledgeable about all aspects of the Garden, including the architecture, history, horticulture, natural sciences, sculpture and trees. Free with regular Garden admission.

march 16 tuesday

Gardening by Design: "Common Problems in Landscape Design"

1 and 7 p.m., Shoenberg Auditorium. Your approach to garden design will affect your enjoyment of your home and yard for years to come. Jane Bath, a landscape designer, will discuss how to get started and will provide ideas for selecting colors to "match your house," choosing the right plants, and integrating your house and yard. *See highlight for details.*

march 23 tuesday

Gardening by Design: "Creating a Low Maintenance Garden"

1 and 7 p.m., Shoenberg Auditorium. Without proper maintenance techniques, gardening can become a chore rather than a pleasure. Andre Viette, a horticulturist, author, lecturer and owner of Andre Viette Farm and Nursery in Virginia, will offer tips on watering, soil preparation and proper plant selection, with an emphasis on perennials. *See highlight for details.*

march 30 tuesday

Gardening by Design: "Designing With Perennials"

1 and 7 p.m., Shoenberg Auditorium. Edith Eddleman, a consultant and designer of the Perennial Border at North Carolina State University Arboretum, will share ideas on combining a variety of plants to create a beautiful "garden picture." *See highlight for details.*

april 2 friday

Arbor Day

10 a.m. to 2 p.m., grounds. The first 500 visitors will receive a free tree sapling. Free with regular Garden admission.

april 3 saturday

Chinese Celebration

10 a.m., Ridgway Center. Food, displays, music and entertainment.

april 17 & 18 saturday & sunday

Bonsai Show

9 a.m. to 5 p.m., Ridgway Center. The Bonsai Society of Greater St. Louis holds its popular annual display. Free with regular Garden admission.

april 22-25 thursday-sunday

Spring Plant Sale

9 a.m. to 5 p.m. daily, open until 6 p.m. on Thursday and Friday; Garden Gate Shop and Orthwein Floral Display Hall. Members take 20% off all gifts and plants in the Shop, all four days.
See page 15.

april 24 saturday

"The Unseen Garden" Open House

10 a.m. to 2 p.m., John S. Lehmann Building. Get a look behind the scenes at the Garden's herbarium and research facility and learn more about our world famous research program in tropical botany. Free with regular Garden admission. *See page 2.*

april 22 thursday

Lecture: "Wildflower and Nature Photography"

7 to 10 p.m., Shoenberg Auditorium. John Smithers, award winning film maker and an authority on wildflower and nature photography, will show slides and discuss his work. $18 / members, $20 / non-members. Seating is limited; advance registration is requested. Call Shaw Arboretum at 1-742-3512 for more information.

april 24 & 25 saturday & sunday

Wildflower and Nature Photography Workshop

Two sessions each day: 6:30 to 10:30 a.m. at the Arboretum; 5 to 7:30 p.m. at the Garden. Join photographer John Smithers for a comprehensive workshop in wildflower and nature photography, taking pictures in the morning and reviewing your work in the evening. $175 / members, $200 / non-members, includes lecture on April 22. **Reservations are limited and advance registration is required. Call Shaw Arboretum at 1-742-3512 for information.**

Members' Days

march 10 wednesday

"Growing Perennials in St. Louis"

11 a.m., Shoenberg Auditorium. A slide lecture by Brian Ward, retired Garden horticulturist and expert on perennials. *Free, for members only.*

april 4 sunday

Arboretum Spring Walk

10 a.m. to 2 p.m., Shaw Arboretum, Gray Summit. Enjoy the beautiful flowering trees and the spectacular fields of daffodils and early woodland wildflowers. Special drawing for "fun" bird houses and feeders. *Free, for members only.*

COMING IN MAY

may 1 & 2 saturday & sunday

African Violet Council Show

9 a.m. to 5 p.m. daily, Ridgway Center. The Metropolitan St. Louis African Violet Council hosts its 39th annual show and sale, featuring all sizes and colors of these popular houseplants. Free with regular Garden admission.

Members

NEW MEMBERS APPOINTED -- The Garden's Members' Board appointed new members at its annual meeting January 11, 1993. Shown seated, from left: Kathy Pratt and Jim Goggins, with Mary Longrais, president of the Board. Standing, from left: Margie Jaffe, Sally Driemeyer, Gale Dean and Liz Teasdale. Not shown: Mary Glaub, Jean Zinsmeyer.

RICHARD BENKOF

OFFICERS ELECTED -- Also elected at the annual meeting were the 1993 Members' Board officers. Shown from left: Mary Longrais, president; Jane Tschudy, first vice president; Dale Whitten, treasurer; Ann Bowen, second vice president; and Minnie Perry, secretary.

Mother's Day Luncheon May 7

"Step Out with Mom" on Friday, May 7, at a gala luncheon party in honor of Mother's Day sponsored by the Garden and Plaza Frontenac. Reservations are $35 per person for members and $45 per person for non-members. Watch your mail for a special invitation in April, or make your reservation by calling 577-9500.

COMING IN JUNE 1993 A New Garden Tour!

Mark June 6, 1993 on your calendar today for our fourth Garden-sponsored tour of some of the most spectacular private gardens in St. Louis. A Garden Tour is held every few years and is one of the most popular of our special events for members only.

Watch the upcoming May-June issue of the *Bulletin* for details. A special invitation will be mailed to all members in April.

PLEASE CHECK YOUR MEMBERSHIP CARD — Before your next trip to the Garden, take a moment to check the renewal date on your card. Expired cards cannot be honored at the Ticket Counter. You can renew your membership when you receive your reminder in the mail, or call 577-5108.

Lewis and Clark Trail Nature & History Tour

June 3 to 16, 1993

"Travels through Natural History" invites you to follow in the footsteps of Lewis and Clark's famous "Corps of Discovery" expedition of 1803-06 along the Missouri River to the northwestern territories. The tour is sponsored by Missouri Botanical Garden, Riverlands Association, and the University of St. Louis Continuing Education Program.

Highlights include lectures on the expedition's relationship with Native Americans, a visit to a restored Mandan Indian Village, and the expeditions' 1804-05 winter quarters at Knife River Indian Villages. Travel by barge through the Gates of the Mountains, studying the changed environment and the spectacular scenery of the "Missouri Breaks," then follow the Columbia River and the Willamette Valley to Portland, where you will visit the expedition's restored winter quarters at Fort Clatsop, and Fort Canby where Lewis and Clark actually reached their goal -- the Pacific Ocean.

The tour returns to St. Louis by air from Portland. Two hours of optional graduate credit are available from U.M. St. Louis Continuing Education at an additional fee. **Reservations are due March 29, 1993.**

Oregon Trail Nature & History Tour

June 16 to 27, 1993

Join us for a 12-day tour of the famous Oregon Trail. Follow the historic route of the thousands of settlers who opened the great American Northwest, experiencing some of the most spectacular scenery in the United States.

One hundred and fifty years ago, in the spring of 1843, a group of over 800 people assembled in western Missouri to head west, a trek that became known as "The Great Migration." Learn of the reasons behind it and the hardships they endured.

Beginning your journey in Portland, Oregon, you will head east, following the route of the fur traders, who were the first to use the Oregon Trail in 1811 as they returned to St. Louis from the Northwest.

During your 12-day journey, you will experience the vastness and beauty of our country and visit the sites used by the early pioneers.

Madagascar

April 2 to 16, 1993

There's still time to join this exciting trip.

Austria, Alsace and the Rhine Valley

August 10 to 23, 1993

Take a romantic journey to Europe's historic cultural heartland and see some of the world's most beautiful gardens. Visit Vienna, home of the Hapsburgs and Schonbrunn Palace; travel by train to Salzburg, Mozart's birthplace, where you will be treated to a special opera performance; explore lovely Mirabell Gardens and the magnificent mountain region where the Trapp family left their legacy of the "Sound of Music."

A picturesque journey through Bavaria and a tour of King Ludwig's sumptuous island palace leads to historic Munich, followed by a visit to Lindau and Lake Constance. On to Switzerland, including St. Gallen Abbey and Lucerne; then drive through Germany's Black Forest to Strasbourg, starting point for a cruise down the legendary Rhine to Heidelberg and Cologne.

This once-in-a-lifetime trip will be led by Brian and Brenda Ward, recently retired MBG horticulturists.

Each of these tours offers Garden members a thrilling travel adventure. Enrollment is limited, so plan to register early. For brochures and complete information on costs and deadlines, please call Brenda Banjak at (314) 577-9517.

GARDEN GATE SHOP

Easter Delights

THIS YEAR EASTER IS APRIL 11 and the Shop is full of surprises and delights for your holiday. Come see the tiny cold cast carrot, which opens to reveal two bunnies harvesting their carrot crop. There are miniature wooden ornaments for your egg tree, a multitude of wonderful spring baskets, and wooden yard signs saying, "Easter Bunny please stop here."

Spring Plant Sale

Thursday, April 22 -- 9 a.m. to 6:00 p.m.
Friday, April 23 -- 9 a.m. to 6:00 p.m.
Saturday, April 24 -- 9 a.m. to 5:00 p.m.
Sunday, April 25 -- 9 a.m. to 5:00 p.m.
Orthwein Floral Hall and Garden Gate Shop

The Shop's annual Spring Sale features the special members' discount of 20 percent off all plants and gifts in the Shop, all four days. Come early to find the answers to all your spring gardening needs, including books, tools, garden accessories and gifts.

Sweet Treats

Just in time for Easter, the Garden Gate Shop is introducing candy from the Price Candy Company of Richmond, Missouri, featuring the Annaclair, a creamy vanilla or fudge center dipped in chocolate and crisp pecans.

Price also has a wonderful variety of chocolates and creams, Bavarian mints, pecan turks and nut clusters. All Price candies are kosher and one variety is salt and sugar free. Sample these wonderful new delights when you come to the Spring Flower Show Members"Preview on March 12! You'll want to stock up for Easter.

100th Anniversary of Peter Rabbit

The Shop is celebrating the centennial of Beatrix Potter's beloved bunny with wonderful books, gardening kits, nightlights, music boxes and figurines.

CLIFF WILLIS

Tatiana Shulkina Joins Garden Staff

In December, 1992, the Garden's Research Division welcomed Tatiana Shulkina, a distinguished botanist from the Komarov Botanical Institute in St. Petersburg, Russia. She had been a member of the staff of the Komarov for more than 20 years and moved to the United States a year ago.

Dr. Shulkina earned her Ph.D. in 1965 and her Doctor of Science degree in 1984, both at the Komarov Botanical Institute. She is an expert on the Campanulaceae, or bellflower family, and on the ornamental plants of Russia and adjacent regions.

At the Komarov Tatiana was curator of the magnificent living plant collection on the grounds of the Institute. The garden displays over 5,000 mostly native herbaceous plants collected throughout the former Soviet Union. In the course of building and maintaining the collection Tatiana travelled widely, from the Caucassian mountains to the Pacific coast in the far east, to the southern borders of Russia and Mongolia. "I used to have potted cuttings all over my hotel room!" she said.

Tatiana helped to introduce many ornamental plants to Russian gardeners, including many hardy species from other regions that can thrive in the harsh climate of St. Petersburg. "I published two books on rock garden plants, one on plants of Central Asia and one on plants from all over the world, including America," Tatiana said. "Today American plants are very fashionable in Russia."

Tatiana's research on the Campanulaceae focused on the lifeforms of plants and their taxonomic significance. At the Garden she is working on the *Flora of China*, where her experience in identifying the plants of Central Asia is invaluable. She is also working to translate Russian texts in the collection of the Garden's library.

"We are delighted to have Tatiana Shulkina on the staff," said Dr. Nancy Morin, assistant director. "She has been a delightful and valued colleague for many years, and her expertise on Eurasian plants is invaluable to our work in the region. We are very fortunate that she is here."

Dr. José Sarukhán, the 1991 Henry Shaw medal awardee, was re-elected in December 1991 as Rector of the Universidad Nacional Autónoma de México, one of the most important institutions in Mexico with 350,000 students. His new term will end in December 1996. The Garden and the Universidad have joined together since 1980 to work on the *Flora Mesoamericana* project, which will produce a detailed account of the plants of Southern Mexico and Central America. The first volume of the *Flora* will be published later in the spring.

The national news from Somalia in recent months has repeatedly mentioned a local plant called "khat" (pronounced "cat") that is chewed by Somalis as a mild stimulant or intoxicant. *Catha edulis*, commonly referred to as khat, qat, or chat, is sold in bunches of fresh, tender cuttings in local markets.

Khat is an important cash crop in the mountains of east Africa, including Ethiopia and Somalia. Fresh supplies of it are flown into many Muslim countries daily, where people chew the fresh leaves much as we would drink coffee or tea. Khat contains caffeine, ephedrine and related compounds, which produce cardiac and respiratory acceleration. It is also used as a decongestant.

The U. S. Drug Enforcement Administration reports that cathine, one of the active components in khat, is a Schedule 4 controlled substance in this country, and a second component, cathinone, is awaiting classification. Therefore, it is not legal to possess *catha edulis* in the United States. —*Illustration from Engler, A. and Drude, O. 1910. Die Vegetation der Erde. Vol. 9 (1). From the Missouri Botanical Garden Library.*

Nepalese Botanist Visits Garden

Dr. Krishna Shrestha of Tribhuvan University in Kathmandu, Nepal, visited the Garden in January and February during a tour of scientific institutions in the United States. Dr. Shrestha was in St. Louis to learn more about TROPICOS, the database system developed at the Garden, which he utilized in his studies at the Komarov Botanical Institute in St. Petersburg, Russia.

Krishna earned his Ph.D. at the Komarov in 1992, working under the distinguished botanist Dr. Armen Takhtajan. Krishna was only the second Nepalese ever invited by the government to study at the Komarov, where he learned Russian to earn his degree. He wrote his dissertation in English, on the Campanulaceae, or bellflower family.

The Garden has been working with the Komarov Institute, one of the world's leading botanical institutions, for many years, and is leading an effort to assist the Komarov in renovating its facilities to preserve its priceless collections of plants (see the *Bulletin*, January/February 1993). Krishna was invited to St. Louis by Dr. Peter Raven, and the Garden is looking forward to working with Krishna and the University of Nepal on future collaborative projects.

"Nepal is very rich botanically, but we are facing great pressures from population growth and development," Krishna said. "I became interested in botany as a child because plants are extensively utilized by the Nepalese as medicines, food, building materials and more. I am looking forward to working to improve conservation of our native plants. I also hope to help develop an herbarium at the University to be used for teaching new botanists as a supplement to our national herbarium, which is located quite a distance from Kathmandu."

While he is in the U.S. Dr. Shrestha will visit with scientists at The New York Botanical Garden, Harvard University's Herbarium, the Smithsonian Institution, the Nature Conservancy, the National Geographic Society and World Wildlife Fund.

CLIFF WILLIS

Dr. Krishna Shrestha

CLIFF WILLIS

Graduate Education

at the Garden

HENRY SHAW'S VISION when he founded the Garden in 1859 included more than a beautiful place for people to visit; it was even more than a place for botanists to carry on their research. Shaw was keenly interested in establishing a garden that would educate future botanists. For this reason he established the Henry Shaw School of Botany at Washington University and specified that the Garden's director be a professor in that school.

Today the Garden educates 20 graduate students from around the world, working in conjunction with Washington University, and also with the University of Missouri-St. Louis, Saint Louis University and Southern Illinois University at Edwardsville. The International Center for Tropical Ecology is a joint program between the Garden and U.M.-St. Louis that has attracted many fine students for graduate studies in St. Louis. Each student has a Garden advisor and uses the Garden's herbarium and laboratory facilities to further their studies.

Collaborating with institutions in countries where the Garden conducts research and training botanists in those countries is an important component of the Garden's work. The Graduate Studies Program reflects this commitment. Of the 20 students currently enrolled, 13 are from other countries, from as far away as China and New Zealand and as nearby as Canada and Mexico.

While the Garden's program is dedicated first and foremost to the science of systematic botany, many of the graduate students have taken systematics and applied it to other disciplines. Song Hong from China, for example, is majoring in both botany and computing at U.M.–St. Louis. In addition to his studies, he helps on the Garden's *Flora of China* project, where his botany, language and computer skills are invaluable. He has even written a program to translate Chinese to English and vice versa.

Guillermo Paz y Miño of Ecuador, a Ph.D. candidate at U.M.- St. Louis, is interested in the economics of botany. In particular he is studying the choosing of sites for nature reserves. Guillermo left his position as environmental vice minister for the government of Ecuador in order to pursue his studies in St. Louis.

The Garden operates the largest program on African botany in any U.S. institution, but it is only recently that we have had a graduate student from Africa or Madagascar. Armand Randrianasolo, whose study is supported by the Claiborne Foundation, is currently finishing his master's degree at U.M.-St. Louis and plans to stay on to finish his Ph.D. before he returns to his native land, where he will be the only western-trained Ph.D. plant taxonomist in Madagascar. The Garden is currently seeking funding to bring other students from mainland Africa to study in St. Louis.

The Garden's graduate students come from U.S. institutions as well. Jennifer Talbot, a student at Washington University and a recipient of a prestigious National Science Foundation Fellowship, studies tropical lianas, or vines, which are difficult to study because they flower only at the tops of trees. While ubiquitous, lianas are the most understudied group of plants in the tropics. Jennifer took an Organization for Tropical Studies course and learned tree-climbing techniques to prepare for her work.

The first graduate of the Henry Shaw School of Botany

continued on page 19

Above: Graduate students at the Garden (front row, from left:) Germán Carnevali; Tzen-Yuh Chiang; Jennifer Talbot; Ivón Ramirez; Barbara Whitlock. (Center row, from left:) Francisco Lorea; Diego Perez-Salicrup; Chris Glores; Guillermo Paz y Miño; Carolina Israel; Song Hong. (Back row, from left:) P. Mick Richardson, advisor; Peter Heenan; Neil Snow; Armand Randrianasolo; Andoni Westerhaus; Ricardo Rueda. Not pictured: Brad Boyle; Guanghua Zhu; Oliver Phillips; Carlos Reynel; Dorothy Speck.

P R O F I L E

Ronald L. Liesner

HIGHLY SPECIALIZED as the world of botany is, it is crucial to have a generalist in plant identification on hand. Ron Liesner, a 20-year veteran of the Missouri Botanical Garden, is the research division's resident generalist.

When a dried, pressed plant specimen from Latin America is so unusual that its family cannot be easily determined, it is handed to Liesner who, literally at a glance, can place it into the correct plant family so that it can be passed along to the appropriate specialist for further study.

Liesner spends a great deal of his time sorting specimens from Central and South America into families for others to study. His role is vital because until a plant specimen is sorted at least to family it lies idle on the shelf. Once placed in its family it can be used by specialists to further the body of knowledge about that family. He can put to family an amazing four or five plant collections a minute.

But many families do not have specialists, and Liesner is up to the challenge. He identifies to the species level those specimens for which there is no expert. He goes through the specimens one family at a time, using books and other herbarium specimens to aid him. "I try to do anything that other people are not doing in Central and South America," Liesner says.

Later, specialists may find that Liesner's species name is not exactly right. But the important thing is that it is placed in the stream of plants being studied. "I saw there was a need for at least a tentative name to be assigned to the plants so that people would have material to study," he says. "This is one of my major goals."

Generalists are becoming increasingly scarce as botanists, like other scientists, become more and more specialized. Liesner was exposed to many plant families which formerly had no specialists and thereby developed a broad-based knowledge. His job is made a little easier as the floristic work of the Garden and other botanical institutions results in more published floras which contain keys to identifying plants.

Liesner came to the Garden in 1973 after five years at the Field Museum in Chicago. He has a B.S. in botany from the University of Wisconsin. He has always been interested in plants and even as a child had an uncanny ability to recognize plants. "I noticed plant families before I knew that plant families even existed," he says. Needless to say, he was delighted when he discovered there was a living to be made in identifying plants.

"There are not many people who do what I do," he says. "In botany, there is a real temptation to want to dig deeper to solve problems. In my job I'm forced to skim the surface and leave the digging to others."

New Building Opened at National Herbarium of Ecuador

ON November 13, 1992, a new building was dedicated at the National Herbarium of Ecuador in Quito. The building was made possible by funds generated by a "debt-for-nature" swap in which the Missouri Botanical Garden participated in 1989 (see the *Bulletin*, July/August 1989). The Garden's contribution is being used to finance field research in Ecuador, training for Ecuadorian botanists and development of the National Herbarium.

The National Herbarium of Ecuador is part of the Ecuadorian Museum of Natural Sciences, a government supported institution located in the capital city of Quito. The Museum and the Herbarium were founded together in 1979, but the Herbarium languished for nearly a decade due to lack of funds to organize its collection.

With the debt-swap funds generated by the Garden's contribution the Herbarium has been able to mount and file more than 60,000 plant specimens, working in a rented building. With the gift of a building in 1992 from the municipal government of Quito, the Herbarium acquired a permanent home for its offices, but the building lacked sufficient space for the plant collection. The new 300-square-meter annex was built with debt-swap funds in the summer and fall of 1992.

The development of the National Herbarium of Ecuador is an example of the close collaboration that the Garden has been building with botanical institutions throughout Latin America. These relationships further the progress of botanical research at very little cost and strengthen the Garden's own research program enormously. This is especially significant in Ecuador, which has an extremely rich flora of about 25,000 species, or about ten percent of the world's total.

Much of the credit for the development of the National Herbarium of Ecuador goes to the efforts of Dr. Calaway Dodson and Dr. David Neill of the Garden's research staff, who have been resident botanists in Ecuador since the mid-1980s; Dodson has studied the flora of Ecuador since the 1950s. Both Neill and Dodson attended the ceremony to dedicate the new building. Also representing the Missouri Botanical Garden were Dr. W. D. Stevens, director of research, and Olga Martha Montiel, assistant to the director of the Garden. Others present included Miguel Moreno, director of the Ecuadorian Museum of Natural Sciences, Rodrigo Paz, former mayor of Quito, Roberto Troya, director of Fundación Natura which administers the debt-swap funds, and the staff of the Museum and Herbarium.

TOWER GROVE HOUSE

Redecorated Rooms On View

WHEN TOWER GROVE HOUSE reopened in February, two newly decorated bedrooms on the original Henry Shaw side of the House were on display to visitors. The woodwork and ceilings have been repainted, as were the walls in the southwest bedroom. The northwest bedroom walls have been papered, and the doors into the hallway have been repainted with the original Victorian false grain effect.

The Tower Grove House Tea Room is open and serving luncheons by reservation only on Tuesday, Wednesday or Thursday. Please call (314) 577-5150 for reservations and information.

In our January issue, the list of organizations that assisted Tower Grove House with its holiday decorations included the Webster Groves Garden Club No. 5. It should have been listed as the Webster Groves Garden Club No. 15. We regret the error. -- Editor

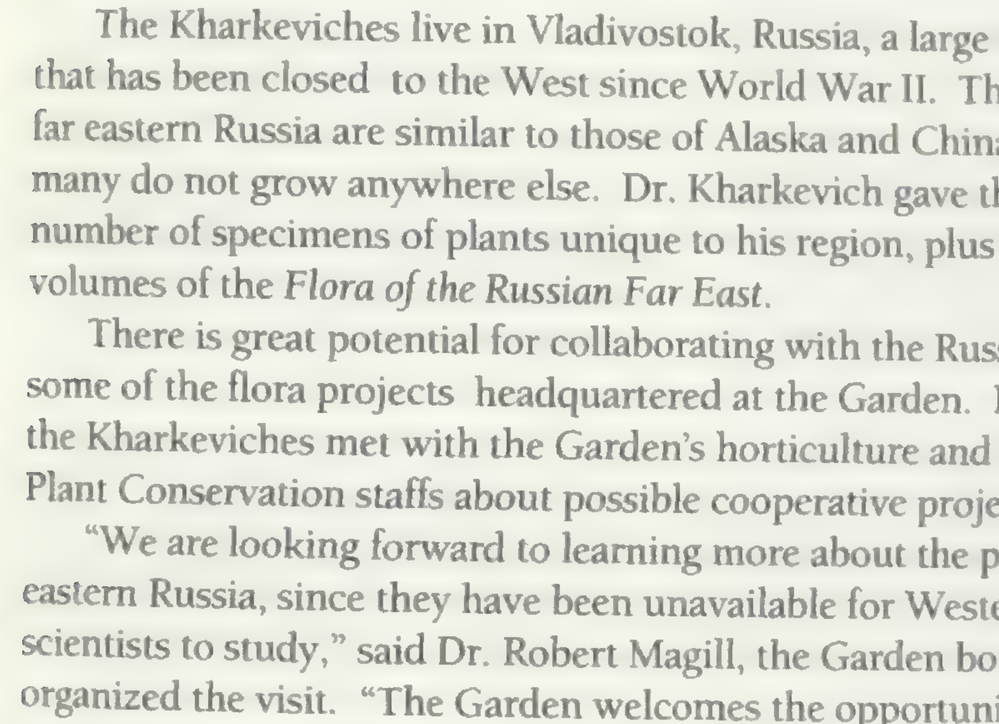
Garden Hosts Botanists from Far Eastern Russia

DRS. SIGIZMUND AND TAMARA KHARKEVICH visited the Garden December 1-13, 1992 to discuss possibilities of cooperation between the Garden and the Institute of Biology and Petology, Far Eastern Branch, of the Russian Academy of Sciences, where Sigizmund Kharkevich is director.

The Kharkeviches live in Vladivostok, Russia, a large naval port that has been closed to the West since World War II. The plants of far eastern Russia are similar to those of Alaska and China, though many do not grow anywhere else. Dr. Kharkevich gave the Garden a number of specimens of plants unique to his region, plus the first six volumes of the *Flora of the Russian Far East*.

There is great potential for collaborating with the Russians on some of the flora projects headquartered at the Garden. In addition, the Kharkeviches met with the Garden's horticulture and Center for Plant Conservation staffs about possible cooperative projects.

"We are looking forward to learning more about the plants of far eastern Russia, since they have been unavailable for Western scientists to study," said Dr. Robert Magill, the Garden botanist who organized the visit. "The Garden welcomes the opportunity to work with botanical institutions throughout the former Soviet Union."



CLIFF WILLIS

From left: Dr. James R. Solomon, curator of the MBG herbarium; Prof. Kharkevich; Dr. Robert Magill.

Graduate Education *continued from page 17*

was Anna Isabelle Mulford, who studied *Agave* to earn her Ph.D. in 1895 and taught in the St. Louis public school system before becoming a professor at Vassar College. Since then nearly 400 students have received their master's or Ph.D. degrees for work done at the Garden.

The program continues to grow in a controlled, planned fashion. By educating both U.S. and foreign students, the Garden plays a vital role in learning more about the plants of the world. Virtually all the students from developing countries who are educated at the Garden return to their home countries and contribute greatly to the body of knowledge of the plants of their country.

Educating students is obviously expensive. The Garden receives funding from private citizens who are friends of the Garden, including the Susie T. Bovard Trust and Mr. and Mrs. Emmet J. Layton, private foundations such as the Mellon Foundation,the Compton Foundation, and the Claiborne Foundation, and government sources such as the National Science Foundation. Alumni of the Garden's program also contribute generously to its support through the annual Alumni Fund.

Individual students as well as Garden staff continue to seek funding to support stipends, field work and research. ■

Shasta Snow Wreath

A NEW SPECIES of *Neviusia*, a genus in the rose family previously known to have only a single rare species, was recently discovered by two botanists in northern California. The new species was published on December 23 in *Novon*, the journal for botanical nomenclature issued by the Missouri Botanical Garden.

Large, showy new plants are seldom discovered. The find has caused great excitement among botanists, who cite it as proof that new species still can be discovered in many parts of the world, not just in remote areas. The discovery of the Shasta snow wreath, as the plant is now commonly called, marks the first time since the genus was established 134 years ago that a new species has been added to the group. The original species of the genus, the rare Alabama snow wreath, *Neviusia alabamensis*, grows in the southeastern United States.

The new species, named *Neviusia cliftonii*, was found by botanists Dean Taylor and Glenn Clifton of the consulting firm Bio Systems Analysis, Inc., in Santa Cruz, California, in an area they frequently traveled. They had suspected that a special micro-climate near some cliffs might yield something interesting, but the biologists had not had the chance to explore that particular area until May 1992.

There they found a puzzling, shoulder-high shrub on the base of a shaded north-facing slope. After painstaking research and consultation with specialists James R. Shevock of the California Academy of Scientists and Barbara Ertter of the University of California at Berkeley, they determined that the shrub was unequivocally *Neviusia*. This came as a such a surprise that the scientists initially suspected that the shrub was cultivated material that had escaped to the wild. But detailed research — and the discovery of two other wild populations the following month -- confirmed that it was indeed a new species of *Neviusia*.

This new species is a sensational discovery.

By publishing the Latin name and Latin description in *Novon*, the species is given botanical validity and the name can be used by other botanists. The paper, written by Shevock, Ertter and Taylor, will announce the discovery to the scientific community.

Dr. Marshall R. Crosby, senior botanist at the Garden and editor of *Novon*, said, "The plant is itself very strange and the find was so unexpected. We feel we know a great deal about North America plants, but I'm sure there are other interesting new species out there."

Henry Shaw Academy / *Spring & Summer Classes*

THE HENRY SHAW ACADEMY at the Missouri Botanical Garden offers students ages 7 to 13 many exciting ways to investigate science, ecology and natural history. Classes are designed to supplement school science programs, to deepen students' appreciation of the natural world.

For a brochure and further information please call (314) 577-5135 or 5140.

Spring Saturday Classes

Ages 7 to 9:

Wildlife Ecology
April 3, 9 a.m. to noon

Bonsai for Breakfast
April 10, 9 a.m. to noon

Discover the World of Wildflowers
Shaw Arboretum
May 1, 10 a.m. to 2 p.m.

Saturday Adventures

Ages 10 to 12:

Adventures from Dusk to Dark
Shaw Arboretum
April 24, 4:30 to 8:30 p.m.

Springs of Missouri
Canoeing Field Trip
May 8, 8 a.m. to 6 p.m.

Summer Science Camp

Ages 7 to 9:

Rain Forest Connections
July 6-9, 9 a.m. to 3 p.m.

Endangered Friends
MBG and St. Louis Zoo
July 13-16, 9 a.m. to 3 p.m.

The Scented Garden
July 20-23, 9 a.m. to 3 p.m.

Tweezers and Terrariums
July 27-30, 9 a.m. to 3 p.m.

Puzzles of Life
Shaw Arboretum
August 2-6, 8 a.m. to 3 p.m.

Creations from the Earth
August 9-13, 9 a.m. to 3 p.m., & August 14, 10 a.m. to noon

Family Classes

Ages 7 to 9:

Knowing and Nurturing Nature
July 31, 9 a.m. to noon

Now You See Them, Now You Don't
August 7, 9 a.m. to noon

Ages 10 to 12:

Mediterranean Meanderings
July 10, 9 a.m. to noon

Trees: Giants of Shaw Arboretum
July 31, 9 a.m. to 1 p.m.

Field Programs

Ages 10 to 12:

EarthKeepers
Shaw Arboretum
June 22-25, 9 a.m. to 3 p.m.

Plant/Animal Interactions
July 13-16, 9 a.m. to 3 p.m.

River & Springs
Current River Canoe Trip
July 21-24

Pandas & Periwinkles
MBG and St. Louis Zoo
July 27-30, 9 a.m. to 3 p.m.

Light Fantastic – Photography
August 9-13, 9 a.m. to 3 p.m.

Ages 13-14:

Aquatic Ecology
Canoeing the Current River and the Arboretum
August 17-20

Pitzman Nature Study Program

For children ages 4 to 6, each with an accompanying adult. Supported by a grant from the Pitzman Foundation; the Pitzman Education Fund has supported Garden programs for 35 years.

Spring Saturday Classes:
April 17, 24 and May 1, 8. Please call (314) 577-5140 for details.

Summer Classes:
Saturdays: June 19, 26; July 10, 17, 24, 31
Wednesdays: June 23, 30; July 1, 7, 14, 21, 28; August 4
Summer Topics will include:
In the Rose Garden
Of Witches, Houses and Things
Dragons and Other Flavors
Jack and the Beanstalk
Tanabata
Beatrix Potter's Garden Story
Plants Underwater
Lotus -- Mud to Bud
Carnivorous Plants
A Fish Called Carp

Gardening Apprenticeship Program
Ages 14 to 17
Gardeners work with MBG staff horticulturists. Limit: five students per session.
Session I: July 1-16
Session II: July 16-30
Session III: July 1-30

CLIFF WILLIS

MAGNET SCHOOL PLANNING -- The Garden is working with St. Louis Public Schools in preparation for the Mullanphy Botanical Garden Elementary Magnet School opening next fall. Shown meeting at the Garden recently are (from left) Dr. Larry DeBuhr, director of education at the Garden; Alicia Ivory House, magnet school coordinator and instructor at the Garden; and Ms. Marian E. Cotter, principal of the new Magnet School.

GIFT PLANNING

THE GARDEN has always been sustained by the generosity of individuals. The Heritage Society recognizes friends and members who have designated the Garden as a beneficiary in an estate plan, whether in a Will or some other legal arrangement.

Thoughtful gifts of this kind are extremely helpful because they allow effective planning for the future. This is especially true for the Garden, where its mission in botanical research, environmental education, and horticultural display is so urgent.

All information about special legal arrangements is kept in the strictest confidence. If anonymity is not requested, donors who have made special arrangements for the Garden are listed in the *Annual Report* as members of the Heritage Society. A quarterly financial planning newsletter called *Heritage* is sent to all of these special members.

But most important is our desire to thank our Heritage Society donors appropriately, to become acquainted with them, and to include them in a variety of special events.

The Garden wants all of its friends to know how important they are to the Garden and how much their commitment is appreciated. For more information about gift planning at the Garden, or to receive our booklet "Giving Through Your Will", please call Ernestina Short at 577-9532 at no cost or obligation.

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Inside This Issue

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TRUSTEES ELECT NEW OFFICERS

John K. Wallace, Jr. succeeds O. Sage Wightman III as president of the Board of Trustees; the new Episcopal Bishop of Missouri and a new Honorary Trustee join the Board.

6.
NEW DEMONSTRATION GARDENS

The Experimental Outdoor Demonstration Garden at the Kemper Center for HomeGardening is donated.

8.
HOME GARDENING

Living fences and screens add beauty to any landscape. Also, telephone hotlines for gardeners.

11.
PLANTS OF CHINA

The Garden acquires one of the largest collection of Chinese herbarium specimens in the West.

12.
CALENDAR OF EVENTS

Gardening by Design, the Spring Plant Sale and a Nature Photography Workshop highlight March and April.

14.
NEWS OF THE MEMBERS

New officers and members are elected to the Board; plus highlights of travel programs and upcoming events.

17.
GRADUATE PROGRAM

Educating future botanists from around the world has always been a vital part of the Garden's mission.

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spring *Flower* show

"Springtime in a Japanese Garden"
Friday, March 12, 1993
5 to 8 p.m.
Ridgway Center

A tranquil Japanese garden awaits visitors to the spring show. Contemplate the quiet beauty of a teahouse, pools, dry gardens and a drum bridge as you stroll winding paths lined with native Missouri spring flowers. Familiar perennials, flowering shrubs and trees including dogwoods, redbuds, forsythias, violets, jack-in-the-pulpits, delphiniums, bleeding hearts, shooting stars, hostas and more. Entertainment, cash bar. Dinner buffet is available in the Gardenview Restaurant. Fashions by Episode of the Galleria. Free, for members only.

Also — **Meet the Author**

Dr. Peter Bernhardt, associate professor of botany at St. Louis University and a research associate at the Missouri Botanical Garden, will be autographing copies of his new book, *Natural Affairs: A Botanist Looks at the Attachments Between Plants and People* (Villard Books, 1993). In a delightful blend of literature and science, the author of *Wily Violets and Underground Orchids* looks at the origins of the folklore and myths that surround many plants.

MEMBERS' PREVIEW

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Missouri Botanical Garden

MAY/JUNE
1993

VOLUME LXXXI
NUMBER THREE

Comment

MISSOURI BOTANICAL GARDEN MISSION

Discover and share knowledge about plants and their environment, in order to preserve and enrich life.

THE STATEMENT ABOVE reflects months of collaboration by many people at the Garden. Recently approved by the Board of Trustees, the Mission Statement is straightforward, and it serves to focus our efforts in the clearest possible way. In planning our course, we can now ask, "Does this activity use information about plants, and does it create better understanding of the relationships between plants, people, and their environment?"

Henry Shaw defined the Garden's mission in his Will by specifying activities to be carried out in horticultural display, education, and scientific research, and to "preserve the same to the use and enjoyment of the public for all time." With the growing challenge of the global environmental crisis, the Garden's resources are strained as never before. The demands of our modern world have placed the Garden in a leadership role worldwide as well as here at home. With our new Mission Statement, updated and defined to meet this challenge, we can move forward with confidence to plan the very best use of our resources for tomorrow and the future.

On page 14 you will find a complete discussion of our recent increase in admission rates for the public. We want you, as members of the Garden, to feel confident that the new fees are reasonable and willmake it possible for us to continue providing quality and service in our displays and public programs.

In keeping with the international scope of our scientific collaborations, we were extremely proud to honor Armen Takhtajan, dean of Russian botanists, with a Henry Shaw Medal at a dinner here in March. We were very honored by the presence of our other guests from the former Soviet Union, Rudolf Kamelin, Olga Kamelina, Vadim Tikhomirov, and Nikolay Vorontsov. The occasion brought together in one place the most prominent leaders of the Russian botanical community, and strengthened our ties with the Komarov Botanical Institute in St. Petersburg.

Throughout this issue you will find activities to delight you and your family as we move into our belated spring season! We hope you enjoy them all. Beginning on Memorial Day the grounds are open until 8 p.m., and we invite you to come down for a tranquil stroll on beautiful summer evenings.

— Peter H. Raven, Director

Visitors at the Brick House

CLIFF WILLIS

NOTED ARCHITECT VISITS SHAW ARBORETUM—Fay Jones (left), an architect renowned for his landmark designs, visited Shaw Arboretum in March. Mr. Jones is shown at the Brick House on the Arboretum grounds with (from left) Lucius B. Morse III, Garden Trustee; Geoffrey Rausch and Missy Marshall of Environmental Planning and Design, developers of the Arboretum's Master Plan; and John Behrer, manager of the Arboretum.

A R B O R E T U M N E W S

Moving?
Please remember to send us your new address.

To avoid missing any of your membership mailings, we need notification of your new address at least three weeks before you move. Please enclose the mailing label on the back cover of this *Bulletin* and mail to:

Name:

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Date effective:

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On the Cover

Foliage of the lotus, *Nelumbo nucifera*, is a feature of the Japanese Garden lake.
Photo by King Schoenfeld

Editor

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1993 Missouri Botanical Garden

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The BULLETIN is sent to every member of the Garden as a benefit of membership. For a contribution of as little as $45 per year, members also are entitled to free admission to the Garden, Shaw Arboretum, and Tower Grove House; invitations to special events and receptions; announcements of all lectures and classes; discounts in the Garden Gate Shop and course fees; and the opportunity for travel, domestic and abroad, with other members. For information, please call (314) 577-5108.

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RICHARD BENKOF

William H.T. Bush (left), first vice president of the Board of Trustees, presents the Henry Shaw Medal to Armen Takhtajan. Mrs. Takhtajan is at right.

Armen Takhtajan

ON MARCH 16, 1993 the Garden presented the Henry Shaw Medal to Dr. Armen L. Takhtajan at a dinner held in the Ridgway Center. Dr. Takhtajan is the leading 20th century botanist of the former Soviet Union. He was born in Armenia, June 10, 1910, and for the past fifty years has been one of the leading experts in the world in systematic and evolutionary botany.

The Henry Shaw Medal has been awarded intermittently since 1893 to individuals who have made a significant contribution to botanical research, horticulture, conservation, the Missouri Botanical Garden or the museum community. Dr. Takhtajan's award was in addition to the presentation that is made at the annual dinner in honor of the Garden Fellows and Henry Shaw associates, which will be held next fall.

Peter H. Raven, the director of the Garden, said, "Even when times were difficult politically, Armen Takhtajan championed interchange between Soviet biologists and biologists all around the world. He has contributed enormously to our understanding of the relationships among plants, which is the very essence of the Garden's research efforts. He has been a good friend of the Garden for many years, and an inspiration to botanists worldwide."

Dr. Takhtajan is a former director and now an advisor to the Komarov Botanical Institute in St. Petersburg, Russia. He is a member of the science academies of Russia and Armenia, a foreign member of the U.S. National Academy of Sciences, a member of the Finnish, Norwegian and Polish academies of science, the German Academy Leopoldina, a Fellow of the Linnean Society of London, and a past president of the International Association for Plant Taxonomy. He has written numerous books and hundreds of scientific papers.

Armen Takhtajan and his wife Alice have spent many months in residence at the Missouri Botanical Garden in recent years. He is currently at work on a new book on the relationships among major groups of plants.

In accepting the Henry Shaw Medal, Dr. Takhtajan said, "I am very grateful to the Missouri Botanical Garden for its help and friendship over the years and for this honor tonight."

MISSOURI BOTANICAL
MAY 17 1993
GARDEN LIBRARY

Centennial of the Henry Shaw Medal

The Henry Shaw Medal, the highest honor bestowed by the Missouri Botanical Garden, was established by the Board of Trustees 100 years ago. Named for the Garden's founder, it honors those who have made a significant contribution to botanical research, horticulture, conservation, the Missouri Botanical Garden, or the museum community. The Medal was awarded intermittently between 1893 and 1935, usually in honor of horticulturists who had introduced significant new plants. The Medal was not awarded again until 1978, when the presentatation became an annual event, usually in conjunction with the annual major donors' dinner in the fall. Occasionally the Henry Shaw Medal is awarded at other times as well.

Henry Shaw Medalists

1893 ***J. Dorner & Son****, for the chrysanthemum 'Major Bonnaffon'*

1897 ***Luther Armstrong****, for his everblooming tuberose*

1899 ***Henry Clinkaberry****, for a hybrid* Cypripedium, *'James K. Polk'*

1904 *Three medals awarded to World's Fair participants*

1907 ***W.A. Manda****, for introduction of* Dracaena mandarana

1935 ***Sir Jeremiah Coleman****, for the gift of a rare orchid collection to the Garden*

1978 ***Roberto Incer Barquero****, President, Banco Central de Nicaragua, for outstanding work in the field of conservation*

1979 ***Julian Steyermark****, botanist, for his Flora of Missouri, work with The Nature Conservancy, and South American plant collections*

1980 ***Anne L. Lehmann****, for significant contributions to the Garden*

1981 ***B.A. Krukoff****, botanist, for pioneering exploration of the Amazon River Basin and his encouragement of the Garden's botanical exploration*

1982 ***Paul Kohl****, horticulturist, for long term contributions as a Garden staff member and volunteer after retirement*

1982 ***S. Dillon Ripley****, secretary of the Smithsonian Institution*

1983 ***Robert Hyland****, regional vice president, CBS Radio, for efforts to promote the successful passage of a bill for tax support of the Garden*

1984 ***Robert Brookings Smith****, former president of the Board of Trustees, for 30 years of service to the Garden*

1985 ***Marlin and Carol Perkins****, former director of the Saint Louis Zoo and his wife, for their joint work promoting conservation*

1986 ***William L. Brown****, distinguished botanist and former president of Hybrid Corn*

1987 ***Koichi Kawana****, designer of Seiwa-En, the Japanese Garden at Missouri Botanical Garden*

1988 ***Ghillean T. Prance****, distinguished botanist and director, Royal Botanic Gardens, Kew*

1989 ***Frans A. Stafleu****, botanist, for significant contributions to botanical history and bibliography*

1989 *Nine businessmen and scientists, all former directors of the Garden or presidents of the Board, in honor of the Centennial of the Board of Trustees:*

Joseph H. Bascom
John H. Biggs
David M. Gates
Henry Hitchcock
C.C. Johnson Spink
Tom K. Smith, Jr.
Robert Brookings Smith
Frits W. Went
Harry E. Wuertenbaecher, Jr.

1990 ***William Ruckelshaus****, first director of the Environmental Protection Agency*

1991 ***Jose Sarukhan Kermez****, plant ecologist, for groundbreaking research on population biology and leadership of future generations of Mexican botanists*

1992 ***Compton J. Tucker****, NASA scientist, for research on the dynamics of Earth's vegetation using space technologies*

1993 ***Armen L. Takhtajan****, botanist, for outstanding contributions to the understanding of relationships among plants*

RICHARD BENKOF

as Minister of the Environment under President Mikhail Gorbachev. Prof. Vorontsov delivered two lectures during his brief stay in St. Louis, speaking at the Garden on "Environmental Problems in the former Soviet Union," and at Washington University on "Issues in Evolution and Genetics." "We are delighted to welcome our friends and colleagues from the former Soviet Union," said Dr. Peter H. Raven, director of the Garden, "and we look forward to collaborating with them on many future projects."

At left: Vadim Tikhomirov, Nikolay Vorontsov, Peter Raven, Olga Kamelina, Rudolf Kamelin.

Distinguished Russian Scientists Visit Garden

GUESTS AT THE DINNER in honor of Armen Takhtajan on March 16, 1993, included several of the most distinguished scientists of the former Soviet Union.

Rudolf Kamelin, director of the herbarium at the Komarov Botanical Institute in St. Petersburg, and chairman of the Department of Botany at St. Petersburg State University, Russia, is one of Russia's leading botanists. During his three-week visit to St. Louis, Prof. Kamelin met with Garden research staff to establish the foundation for future collaborative efforts between the Garden and the Komarov Botanical Institute. Prof. Kamelin serves as a regional advisor to the *Flora of China*, which is headquartered at the Garden, and has made major contributions to the project. He is an expert on many plant groups, including *Allium*, which includes onions, garlic, and chives, and *Astragalus*, the milkvetch group. For the past year Prof. Kamelin and his staff at the Komarov Institute have been reviewing and revising treatments of various groups of plants for the *Flora of China*.

Prof. Kamelin was accompanied by his wife, Olga Kamelina, a distinguished plant embryologist at the Komarov Institute. Dr. Kamelina is an international authority on the development of seeds in poorly known plant families and is the author of over 100 scientific papers. While in St. Louis, Dr. Kamelina worked with colleagues from the Garden and other institutions, consulted the Garden's library and herbarium, and studied the living plant collection in the Climatron.

Also visiting from Russia was Vadim Tikhomirov, professor of botany and chairman of the Department of Higher Plants at Moscow State University and another of Russia's leading botanists. Prof. Tikhomirov is a renowned field botanist, educator, and an expert in the Umbelliferae, or carrot, family. As the editor of many local floras and of regional checklists of rare and endangered species, he is considered to be the leading expert on the flora of central European Russia. Prof. Tikhomirov will treat some genera of the Umbelliferae for the *Flora of China*. Also visiting the Garden was Nikolay Vorontsov, one of Russia's leading zoologists, who served

ISF Awards $500,000 to Komarov Institute

THE INTERNATIONAL SCIENCE FOUNDATION (ISF) has awarded $500,000 to the Komarov Botanical Institute of St. Petersburg, Russia, for general renovation of the institute's herbarium and library building. The January/February 1993 Bulletin announced a major initiative led by the Missouri Botanical Garden to help save the priceless plant collection at the Komarov Institute, which is threatened by deteriorating buildings.

The ISF is a new foundation created recently by Hungarian-born philanthropist George Soros, who has announced plans to give away $100 million over the next two years to help salvage scientific enterprises in the former U.S.S.R. The grant to the Komarov Institute is the largest made by ISF to date.

Responding to an appeal from the Garden, a team of consultants from Sverdrup Corporation went to St. Petersburg last year to assess the situation at the Komarov Institute and prepare recommendations for stabilizing and improving the facilities. Initial funding for the assessment was provided by the John D. and Catherine T. MacArthur Foundation.

NEWS FROM THE LIBRARY

Ewan Collection Conservation Project

THE SHOENBERG CONSERVATION CENTER of the Garden's Library has received a $5,000 grant from the Bay Foundation as part of the effort to conserve more than 2,000 books that comprise the Ewan Collection. The Ewan Collection, purchased by the Garden in 1986, includes the research materials, personal papers, and more than 5,500 books assembled over his lifetime by Joseph Ewan, eminent historian of natural history. The collection is especially strong in the history of natural history, biography, and exploration, and it includes many rare or unique items.

The books to be conserved with Bay Foundation funding were chosen by Professor Ewan on the basis of a composite criteria of rarity, relatedness to other titles in the Ewan Collection, and the neotropical regional character that makes them especially useful for consultation by the Garden staff. These books will be sent to Richard Baker, an independent hand bookbinder located in St. Louis.

Vicki Lee, the Garden Conservator, is working with Garden volunteers trained by her to conserve the other books and pamphlets that are a part of the project. The work they are doing uses various conservation techniques, including mylar dust jackets, the construction of protective pamphlet binders and lightweight phase boxes, paper repairs, resewing, rebinding, and full restoration treatment. The Institute of Museum Services has provided $2,162 for materials and supplies to fund this portion of the project.

Secret Garden

IT'S NO SECRET that Jane and Whitney Harris love the Missouri Botanical Garden and orchids. Soon, the Harrises will be able to share this love with visitors to the Garden, through "The Jane and Whitney Harris Secret Garden".

This secluded, intimate oasis will be located to the northwest of the William T. Kemper Center for Home Gardening. A paved brick path through a lath house featuring an array of orchids invites the visitor to explore the hidden garden beyond. Those venturing within the screening walls of evergreens will find themselves surrounded by a circular border of soft pink, yellow and cream flowering plants. The only counter to the secret garden's tranquility is a bronze sculpture of the Harris's cocker spaniel, Sito, poised and ready to play with a prickly porcupine.

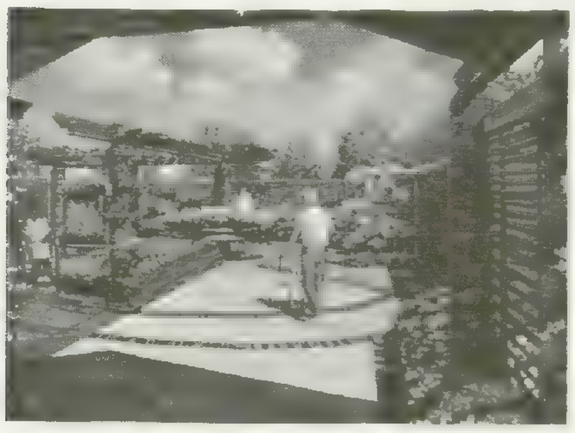
CLIFF WILLIS

The Harrises have been Garden members since 1958. They are orchid growers and for many years have supported the Garden's orchid collection, as well as education programs offered through the Shaw Arboretum's Freund Center. Mrs. Harris said, "Our gift is in recognition of Peter Raven's inspiring leadership and achievement, and of our longstanding friendship with both Tamra and Peter. We also deeply appreciate the help we have received over the years from the Garden's outstanding horticulture staff, especially Steve Wolff and Marilyn LeDoux."

In acknowledging the gift of the Secret Garden, Dr. Raven responded, "We are delighted to recognize all that Jane and Whitney Harris have done for this institution so tangibly through the addition of such a lovely inspiring garden."

The Jane and Whitney Harris Secret Garden is one of 23 residentially scaled demonstration gardens planned for the Kemper Center for Home Gardening in the near future. In this and coming issues, we will describe the gardens, both those already sponsored and those still available for donation. Members interested in learning more about sponsorship may call the Development Office at (314) 577-5120.

Future Gardens

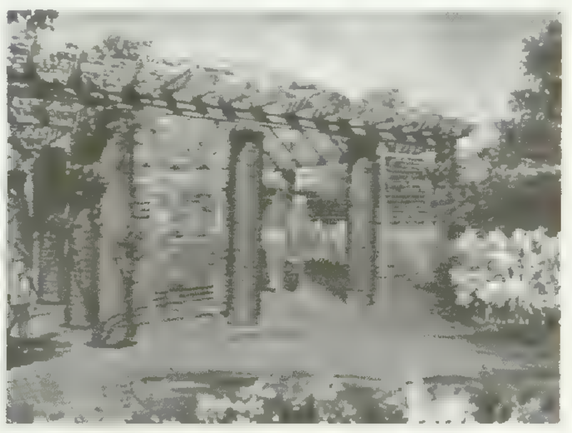


GARDEN FOR ALL

Gardening techniques and materials for people with disabilities is the focus of the Garden for All. The garden will feature raised beds, planters at various heights, benches for kneeling or sitting, hanging baskets lowered by pulleys, and a display of specially modified tools. Included are audio descriptions, braille signs, and plants chosen for fragrance and texture for the visually impaired. Trees and a cedar arbor provide welcome shade.

BACKYARD GARDEN

Entering from the middle level of the Kemper Center, visitors are drawn to the Backyard Garden's seating terrace. There they may view a splashing fountain and pool containing a cast bronze sculpture of four playful otters chasing a group of leaping fish. The garden will display equipment and plantings suitable for every home gardening need, such as groundcovers, lawn and container plantings, lighting fixtures, furniture, watering systems and paving materials.



LATH HOUSE

The Lath House is both a garden house and a demonstration facility. Here visitors are sheltered from the hot summer sun by the cedar lath overhead as they learn the latest gardening techniques at the demonstration sink and table. A raised planter displaying house plants vacationing out of doors stands along one wall; colorful hanging baskets of the plant varieties that thrive best in St. Louis add to the decor of this alfresco classroom.

AT LEFT: Shown with an architect's rendering of the Secret Garden are (from left) Whitney Harris, Jane Harris, and Shannon Smith, director of horticulture.

DEMONSTRATION GARDENS planned for the Kemper Center for Home Gardening:

Agronomic Garden

Apple Allee

Backyard Garden

Bird Garden

Butterfly Meadow

Children's Garden

City Garden

Entry Court

Experimental Garden

Fruit Garden

Garden for All Seasons

Garden for a Family of Four

Groundcover Display

Lath House

Lawn and Flower Borders

Limestone Glade

Native Shade Garden

Overlook Garden

Ornamental Vegetable and Flower Gardens

Prairie Garden

Rock Garden

Rotating Display

Secret Garden

Terrace Garden

This Spring at Shaw
Arboretum

This spring Shaw Arboretum has three exciting new natural areas on view. Come celebrate springtime with a visit to the Arboretum in Gray Summit, just 40 minutes west of St. Louis on Interstate 44.

Whitmire Wildflower Garden Opens

VISITORS TO THE ARBORETUM will be thrilled by the magnificent new Whitmire Wildflower Garden occupying 5-1/2 acres on the hillside below the Brick House at the south end of Pinetum Lake. Construction of the area began in 1992, supported by a gift from Mr. and Mrs. Blanton J. Whitmire and their family.

Above: One of the two gazebos in the Wildflower Garden.

From the top of the slope visitors have a panoramic view south toward the prairie. Winding paths lead down the wooded hillside through a variety of natural plant communities, including a glade, a wet meadow, tallgrass prairie, pine and hardwood savannahs, and woodland. The plants in the Wildflower Garden are from known native sources; many come from the Arboretum or from nearby counties, some from local nurseries, and some were obtained by seed exchanges with the North Carolina Botanical Garden and New England Wildflower Society.

"We want to get people excited about wildflowers!" said Scott Woodbury, the horticulturist in charge of the Wildflower Garden. "This area is not a habitat restoration, but a demonstration area for natural plant communities. We've made a special effort to include some of the underused native shrubs that are suitable for home landscaping: showy species that are available in the trade, like the bottlebrush buckeye, *Aesculus parviflora*, and sweetbay magnolia, *Magnolia virginiana*, for instance. There's also the Carolina rose, *Rosa carolina*; because it's native to this region, it is very hardy and doesn't require spraying."

The landscape design of the Whitmire Wildflower Garden was laid out by Environmental Planning and Design of Pittsburgh. The design includes two reflecting pools, one with a beautiful curving boardwalk over the water, a spring pool for wet meadow species, and a couple of charming gazebos where visitors can sit and enjoy the garden. The ponds harbor iris, milkweed, cardinal flower, and other moisture-loving plants along their banks. Other areas will display some of the region's endangered species, such as Tennessee coneflower and running buffalo clover.

"The Whitmire Garden is a wonderful place to see birds, also," said Woodbury. "The construction and planting didn't disturb the bluebirds that were living here at all; in fact, we've created more habitat for them."

Scott continued, "I would also like to mention the 18 regular volunteers who helped with this garden. They had a major impact on every aspect of the project, from collecting seed to planting and maintenance. We couldn't have done it without them."

As spring gives way to summer something new will always be coming into bloom in the Wildflower Garden. "We encourage every Garden member to come to the Arboretum and enjoy this showcase for our native wildflower species," said Dr.Peter Raven, director. "We are extremely grateful to the Whitmires for making this splendid new garden possible."

New Nursery Area

ON THE NORTHERN EDGE of Shaw Arboretum, ten acres of former farmland have been developed into a new nursery area during the past year, made possible by the generosity of the Edward K. Love Conservation Foundation. The new nursery will be used to propagate and nurture plants for the Arboretum, the Garden, and Tower Grove Park. It also provides facilities for protective cultivation of the endangered species maintained by the Garden as part of the National Collection of the Center for Plant Conservation (CPC).

Above, top: James Trager inspects the new nursery plantings.

This is a wonderful addition to our facilities," said Dr. Shannon Smith, director of horticulture at the Garden. "The new nursery makes it possible to expand our collections and support our displays in ways never before possible. It will allow us to develop a plant introduction and evaluation program and expand our activities with Missouri native species. Also, by utilizing a tract of former farmland, we didn't have to alter the existing natural appearance of the Arboretum or destroy any valuable vegetation."

The entire nursery area is protected by a deer fence. Water lines run to the planting rows for irrigation, controlled by a timing system. A small maintenance shed was moved to the site from another location in the Arboretum,

May Is American Wetlands Month

The third annual American Wetlands Month celebrates our natural biological heritage. Wetlands support a wide variety of plant and animal populations that depend on the ecosystem for food, shelter and breeding areas. Wetlands form a crucial part of our biosystem, purifying water by trapping sediment, retaining nutrients and processing wastes. One half of the original 221 million acres of wetlands in the lower 48 states have been destroyed by development, and an additional 290,000 acres continue to be lost each year.

The Henry Shaw Academy at the Missouri Botanical Garden is observing American Wetlands month with special activities. Students in the Stream Ecology Program and the Explorers Program will travel to the Mingo Swamp Wildlife Refuge in Puxico, Missouri, to collect swamp plants with the permission of the U.S. Fish and Wildlife Service, working under the direction of professional ecologists. The following weekend the students will plant the valuable wild species in the new wetlands area at Shaw Arboretum, enhancing the variety of plant life featured in the habitat and learning first hand about the relatively new science of restoration ecology.

American Wetlands Month is sponsored by the Terrene Institute and the U.S. Environmental Protection Agency, Wetlands Division. For more information write The Terrene Institute, 1717 K Street, N.W., Washington, D.C. 20006, or call the Wetlands Hotline, 1-800-832-7828.

and over 2400 feet of planting rows have been prepared, with plenty of room for expansion.

"We have about 600 plants set out, representing about 50 species," said Scott Woodbury. "Most of the plants are trees and shrubs. The stand of mature pines in the nursery provides shelter for shade-loving plants. Most of the endangered CPC plants are herbaceous perennials and will be grown in raised beds."

John Behrer, manager of the Arboretum, said, "The Arboretum is devoted to conservation and environmental education, and the new nursery will really help us to expand our efforts. We are very grateful to the Edward K. Love Conservation Foundation for supporting this project."

New Wetlands Area

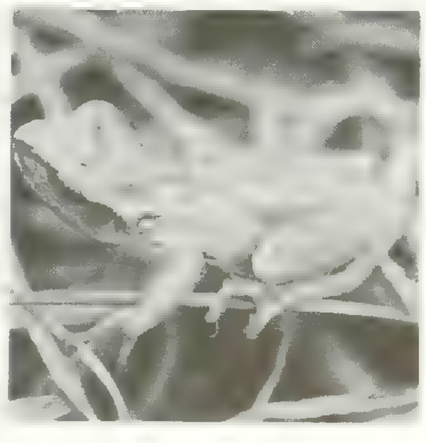
CONTRUCTED IN THE SUMMER OF 1991, the new wetlands area is coming into its own this spring as last year's new plantings come into bloom for the first time. Development of the area was made possible by generous donations by August and Ruth Homeyer and Mary Jane Fredrickson, plus a $5,000 grant from the U.S. Fish and Wildlife Service. Technical assistance was provided by the Franklin County Soil Conservation Service.

The new pond marsh is just a five-minute walk from the Adlyne Freund Education Center. It is also accessible by a new trail from the east end of the Tallgrass Prairie.

Fed by natural runoff and oxygenated by prevailing winds, the wide, shallow pond and wet fringe areas are intended as a restored natural area and high-quality wildlife habitat; a rich, complex ecological mosaic. Plantings emphasize native species, including emergent slough grass, *Spartina pectinata*; rushes and reeds, *Juncus, Scirpus* and *Sparganium* spp.; submerged water celery, *Vallisneria americana*; pond weeds, *Potamogeton* spp.; and native water lilies, *Nuphar* and *Nymphaea* spp. There are also wildflowers such as rose mallow, *Hibiscus militaris*; false aster, *Bettonia asteroides*; sneeze weed, *Helenium autumnale*; and swamp milkweed, *Asclepias incarnata*. Many moisture-tolerant tree species native to the southern Missouri wetlands have been planted, including bald cypress, *Taxodium distichum*; sweet gum, *Liquidambar styraciflua*; cherry bark oak, *Quercus pagoda*; willow oak, *Q. phellos*; and water oak, *Q. nigra*. Invasive species such as Siberian honeysuckle and privet will be culled out by cutting and controlled burning.

"We're already seeing a lot of wildlife," said Dr. James Trager, Arboretum naturalist. "There are numerous resident amphibians and migrating waterfowl, and I saw feeding kingfishers and herons through last summer. The watershed of the wetland is being developed as a prairie into which we hope to attract or introduce grasshopper mice, Franklin's ground squirrel, and maybe some of the rare prairie butterflies, as well as a rich array of grasses and wildflowers."

The rich biological diversity of the new wetland makes it ideal for education programs. Classes will focus on food chains, the water cycle and plant/animal adaptations. Join the singing frogs and birds and see the plants flowering for the first time this spring at the Arboretum's new wetland area.



PHOTOGRAPHS BY CLIFF WILLIS

Left: James Trager overlooking the pond at the wetlands. Above: Trager, Shannon Smith and Scott Woodbury in the Wildflower Garden.

Home Gardening

IRISES: A RAINBOW IN THE GARDEN

History

The iris is one of the oldest garden perennials. The flower takes its name from the Greek goddess Iris who, according to legend, walked a rainbow pathway through the sky. Four thousand years ago in Crete, the iris was the prized possession of priests and princes. To the Egyptians the iris stood as a symbol of majesty and power. It was placed on the brow of the Sphinx and on the scepters of their kings; the three petals of the flower symbolized faith, wisdom and valor.

According to French legend, in 1180 King Chloris, at war with the Goths, was directed to a safe crossing place over the River Lys by a profusion of yellow flag irises. In gratitude, the King adopted the flower as his personal device and named it the "Fleur-de-Lys". Many years later Louis VII also chose the lovely water iris as his badge and it became known as the "Fleur-de-Louis."

Classification

Iris flowers have six petals. The three upright petals are called "standards" and the three that hang down are called "falls." The genus is composed of 200 or more species in two major groups: rhizomatous and bulbous.

Rhizomatous Irises

Rhizomes are underground stems that function as a storage organ for food produced by the leaves. Each year, underground offshoots develop from the original rhizome. These offshoots may be divided and transplanted to grow new irises. Within the rhizomatous group, three sub groups are distinguished: the bearded or pogon irises, the crested or evansia irises, and the beardless or apogon irises.

Bearded Irises: Bearded irises possess broad leaves with large, fleshy rhizomes. The true bearded or pogon irises have a dense, furry strip or beard that runs down the middle of the falls. Other bearded subgroups have seeds with prominent, cream-colored arils, or seed appendages, and are often referred to as the "aril" irises.

Crested or Evansia Irises: Instead of beards or hairs, the crested or evansia iris has a crest like a cockscomb along the center of the falls. The flower of the crested iris is similar in form to the beardless Japanese iris, only smaller.

Beardless Irises: The beardless irises have smooth falls, without hairs or crest, and leaves that are long and narrow. This group has the largest number of species and the widest geographic distribution. It includes the Siberian, Spuria, Japanese, California and Louisiana irises.

Bulbous Irises

The characteristics of bulbous irises vary so greatly that they are separated into two sub-groups: *Xiphium* and *Scorpiris*. Almost all bulbous irises are beardless with narrow segments. The important differences for classification are found in the rootstocks.

Xiphium: In the *Xiphium* subgenus, the bulbs are rootless during the resting stage. Bulbs are smooth except those of the reticulate irises, which are distinguished by a netted or reticulated covering. The group includes Dutch, Spanish, English and the small early flowering reticulate irises.

Scorpiris: Members of the *Scorpiris* subgenus, such as the *Juno* iris, are characterized by thick fleshy roots that persist during the resting stage.

Reblooming Irises

Both rhizomatous and bulbous irises include reblooming varieties. Rebloomers have two distinct periods of flowering, summer and late autumn. While rebloomers often are less robust than other irises, a light application of fertilizer following first bloom and water during summer dry periods result in increased vigor and fall bloom. The widest selection of color and size is to be found in the bearded irises. A few of the cultivars of Siberian, Japanese, Louisiana (beardless) and aril irises (bearded) have the reblooming trait, but the color range for beardless rebloomers is still somewhat limited. Each cultivar reblooms at a different time extending the iris season well into autumn in much of the country.

Landscaping

Thanks to their extraordinary variety of color, size, shape and cultural characteristics, irises can be a part of almost any landscape. They enhance perennial borders in sun or partial shade, and some varieties even thrive in rock gardens and marginal soils, or in wet areas along the borders of ponds and lakes. Choose species carefully to meet the needs of your site.

Planting Irises

The best time to plant rhizomatous irises is late July to early September. Later planting may not allow adequate time for plants to become established. Irises prefer a sunny, well-drained location. Never plant irises where water will stand on the bed. If necessary, raise the beds above ground level.

Iris beds should be prepared at least two weeks in advance to allow the soil enough time to settle. Prepare the bed by deep digging, 10 to 12 inches, to create excellent drainage. To improve the soil root zone characteristics, work organic matter such as well-decayed manure or compost into the subsoil. A good rule of thumb is to add an amount equal to half the depth of the soil you want to condition; for example, a three-inch layer of compost over six inches of soil, a six-inch layer over 12 inches of soil, and so on.

While working compost into the soil, apply a complete fertilizer such as 5-10-10 at a rate of two pounds per 100 square feet of bed area and till into the topsoil of new beds. To improve acid soils, lime may also be worked into the topsoil, but only as directed by a soil test. Lime is not required if the soil pH is above 6.2.

When planting, dig two slanting holes about two inches apart and five inches deep, leaving a shallow ridge of soil between them. Set the rhizome firmly on this ridge and spread half of the roots into each hole. Cover the roots and firm the soil around them. Cover each rhizome completely, but not deeply, so that the rhizome is slightly exposed. Firm the soil around the rhizome and water in well to settle the soil.

Generally iris clumps are planted 18 to 24 inches apart. As a suggestion, plant three to seven sections of each variety so that all of the leaf-fans face the same direction. Plantings should be made in a triangle or in a staggered design with the growing points to the outside of the clump. This will insure that the plants will continue to grow in the same outward direction without crowding each other.

Bulbous irises should be planted at least three inches deep and approximately four to five inches apart, similar to daffodils and tulips. Plant bulbs no deeper than two times the diameter of the bulbs. When replanting, select only the larger bulbs, leaving the smaller bulblets in the ground to mature.

Maintenance

Established beds of iris may be fertilized early in the spring and again after blooming. Use a complete fertilizer as described above at a rate of one pound of 10-10-10 per 100 square feet. Avoid overfertilizing with nitrogen, as excessive amounts may encourage soft, vegetative growth. Applying a light top-dressing of superphosphate in the spring will improve quality of bloom. For spot treatment, a handful of bone meal with 25% available phosphorous may be mixed into the planting hole of each plant.

Irises are shallow rooted and need supplemental watering every week or so. Thoroughly soak the soil when watering. Do not water again until the soil is dry. Irises are susceptible to problems in wet or poorly drained soils.

Remove faded flowers of irises on a routine basis to allow space for new flowers to develop. This practice will also discourage seed development. After all the flowers have faded, cut the flowering stem to the ground and remove the outside leaves. As the summer progresses, continue removing the yellowing leaves from the clump.

Freezing and thawing may cause winter heaving of soil, which loosens the roots and may push iris plants completely out of the ground. Newly set rhizomes are particularly susceptible to heaving out of the ground in a severe winter if they are not mulched. Prairie hay or evergreen boughs make a suitable winter mulch for irises. Apply the mulch after the ground is frozen, and remove it in early April.

Division

Most rhizatomous irises should be split every three to five years. Divide iris clumps in the summer or early fall before September 15 in the St. Louis area. Begin by cutting back the leaf fans to one-third their original height. This will help to reduce water loss until the roots are able to take hold again. Dig the clumps by placing a spade under them and lifting the entire mass. After the clumps are dug, wash them clean with the hose, and carefully inspect the rhizomes for rot and borer damage. Use a sharp knife to separate the rhizomes. Dip your knife in a solution of one part bleach to nine parts water between cuts to keep the tool sterile. Be sure to leave as many roots on each rhizome as possible.

Discard the old center divisions and replant the fans with the cutback foliage. As a safeguard against disease, the rhizomes may be dusted with sulfur or a fungicide before replanting.

—Katie Belisle
Horticultural Coordinator,
Center for Home Gardening

TELEPHONE HELP

The Garden has several telephone services available to assist you.

GardenLine **577-9400**
24-hour recorded information about Garden events, hours, admission and directions.Outside area code 314, call **1-800-642-8842** toll free, 24 hours a day.

Horticultural Answer Service (314) 577-5143
Monday through Saturday, 9:00 a.m. to noon. Master Gardeners are on hand to answer your gardening questions. The Answer Service does not have Saturday hours November through February.

Callers' Tip: The Answer Service receives thousands of calls every year and often the phone lines are busy. Please don't give up! Better yet, call on Saturday morning. Chip Tynan, head of the Answer Service, says that is the best time to get through quickly.

HortLine **(314) 776-5522**
24-hour recorded gardening information is available with a touch tone telephone. You will need a brochure listing the hundreds of HortLine topics in order to use the service; you may request a brochure by calling the Kemper Center for Home Gardening at (314) 577-9440, 10 a.m. to 4 p.m. daily. **Plants in Bloom at the Garden** is updated weekly. Press 3 when you call HortLine.

Master Composter Hotline (314) 577-9555
9 a.m. to noon, Monday through Friday. Specially trained Master Gardeners are on hand to answer your questions about yard waste management techniques. After hours leave a message and your call will be returned. The Master Composter program is supported by the Monsanto Fund.

Kemper Center for Home Gardening

Open 10 a.m. to 4 p.m. daily.

The Plant Doctor is available 10 a.m. to noon and 1 to 3 p.m. Monday through Saturday.

Admission to the Kemper Center is free with regular Garden admission.

FROM THE ANSWER SERVICE

Every year I plant cucumbers. To save space I train them up a trellis that I make out of wire, and every year the same thing happens--just after I start to harvest, the vines dry up and die. My friend says the metal wire gets too hot and burns them up. Do you think this is the problem?

Cucumbers have no trouble climbing up a wire trellis and this is a good space saving technique. Vines that die soon after harvest begins are usually infected by a bacterial wilt disease. This disease is spread by infectious cucumber beetles feeding on the plants early in the growing season. The only solution is to control the beetles, because once an infected insect feeds on a plant, the disease is spread through the sap and no cure is available.

There are two types of cucumber beetles common in this area. The spotted type is a quarter-inch long greenish-yellow beetle with 12 black spots on its wing covers. Adults become active in spring as soon as temperatures reach 70 degrees F. The striped cucumber adults are yellowish in color with 3 black stripes along the length of their wing covers. They become active in spring when temperatures rise above 55 degrees F.

Since cucumbers are normally planted after the striped beetles become active, it is important to begin control as soon as plants are growing. Several insecticides, both organic and inorganic, are labeled for the control of these pests. They are commonly available from garden centers. Overall control strategies should also include sanitation. Remove weeds growing near the garden every fall to eliminate some of the sites where pests can survive over the winter. Some gardeners feel that planting radishes, nasturtiums and marigolds nearby seems to dissuade beetles.

In any event, always grow disease-resistant varieties. 'County Fair' and 'H-19 Little Leaf' have tolerance to bacterial wilt. Cucumber beetles also are more attracted to the older "bitter" varieties of cucumbers, preferring their taste to the new "bitterfree" types such as 'Marketmore 80' and 'Sweet Slice'. These are all good cultivars for the St. Louis area.

I'm becoming interested in growing more native trees and shrubs in my garden. What do you suggest?

In recent years the nursery industry has responded to the increased interest in native species with the introduction of several outstanding plants. Gardeners having difficulty finding sources for these plants can obtain information from the Kemper Center for Home Gardening or the Horticultural Answer Service.

The Fox Valley river birch, *Betula nigra* 'Little King', is a dwarf form of the red birch. Maturing at eight to ten feet, it has great potential for smaller landscapes. Like the species, it prefers moist, fertile, acid soils, can be grown in single or clump form, and is untroubled by the bronze birch borer.

The American hornbeam, *Carpinus caroliniana*, grows to 20 or 30 feet in height, with a spreading, rounded crown and fall leaf colors of yellow, orange and red. It is best sited in partial sun, but can grow in heavy shade, and adapts to a wide range of soil conditions. It is noted for its bluish-grey sinewy bark, a characteristic that gives rise to its common names of blue beech or musclewood.

'Henry's Garnet' sweetspire, *Itea virginica* 'Henry's Garnet', is an award winning selection of the Virginia sweetspire shrub, growing to three or four feet in height and about five feet in width. In the wild, sweetspires are found in wet spots in either sun or shade, but once established in a home garden they are remarkably shade and drought tolerant. 'Henry's Garnet' blooms in six-inch racemes of fragrant flowers in late May or early June. One of the last shrubs to color in fall, the brilliant reddish-purple foliage is worth the wait.

Winterberry hollies, *Ilex verticillata*, are easily overlooked during the growing season, but from autumn through spring several outstanding varieties command attention with magnificent berry displays. Among the red fruited cultivars, 'Cacapon', 'Winter Red', and 'Red Sprite' are particularly noteworthy, while 'Winter Gold' and 'Aurantiaca' bear orange fruits throughout the winter landscape. Winterberries prefer moist, acid soils that are high in organic content, in full sun or partial shade. They will tolerate both heavy and wet soils. All of the above cultivars mature around six to ten feet in height and spread, with the exception of 'Red Sprite', which reaches three to four feet at maturity. All require a male pollinator for fruitful display.

--Chip Tynan,
Horticultural Answer Service

Call the Horticultural Answer service 9 a.m. to noon, Monday through Saturday, at 577-5143.

CENTER FOR PLANT CONSERVATION

Endowment for Endangered Midwestern Plants Is Growing

THE FUTURE of 20 of the midwest's most imperiled native plant species, currently under protection and cultivation at the Missouri Botanical Garden, has been further ensured by contributions of 13 donors to the St. Louis Campaign for the National Collection, a special endowment fund to benefit this critical work.

The plant species are part of the more than 400 species in the National Collection of Endangered Plants, which are maintained through the Center for Plant Conservation at 26 regional botanical gardens and arboreta throughout the United Stated. In 1991, the CPC's national administrative headquarters became a division of the Garden with offices in the Garden's new Conservation Center.

Contributions are matched by the Andrew W. Mellon Foundation and the Center for Plant Conservation's Trustees. For information on contributing to the fund, please call Claudia Spener in the Development Office at 577-9455.

The Garden and the CPC wish to thank the following donors for their generous support of the National Collection:

Mrs. W. L. Lyons Brown Jr.
Mr. and Mrs. William H. T. Bush
Mrs. George D'Arcy
Mr. John Karel
Mr. and Mrs. John Klein
Mr. and Mrs. Hal A. Kroeger
Mr. and Mrs. Fred Kummer
Mrs. Warren B. Lammert Jr.
Mrs. Sears Lehmann
Mrs. John E. Mackey
Mr. and Mrs. G. Rodney Miller
Dr. and Mrs. Thomas Ott
Mrs. Elizabeth R. Pantaleoni
Mr. and Mrs. Warren M. Shapleigh

Left: A school garden plot. Below: Volunteers help to build a community garden.

Gateway to Gardening Association

THIS PAST winter the Gateway to Gardening Association (GTGA) moved into its office in the new Conservation Center at the Garden. "The Urban Gardening Coalition, which includes the GTGA, the Garden and University Extension, collaborates in many ways to help St. Louisans," said Michael Adrio, director of GTGA. "The Garden's new Conservation Center makes it possible for us to share adjacent office space and staff support. It's a tremendous help."

GTGA is a not-for-profit organization that assists city residents in starting and maintaining community vegetable gardens. GTGA grew out of the Urban Gardening Program that was begun in 1978 by the federal government to improve the nutrition of low income families. From 1982 to 1990 the program was administered essentially without staff by Kitty Hoblitzelle, a volunteer, and a dedicated Board of Directors. By 1991 the program had grown so large that Adrio was hired as a full time director.

In 1989 GTGA was working with about 30 community gardens; today it assists 57 gardens, and will establish 15 to 20 new ones this spring. GTGA helps neighborhood groups on the north and south sides to convert vacant, trash-filled lots to productive use. The association raises money and donations of tools, tilling, seeds, topsoil and lumber for raised beds, and coordinates the 200-300 volunteers who teach gardening techniques and help the residents to build the gardens. GTGA stays in touch with each garden group from year to year, providing assistance, encouragement, and acting as liaison to various civic agencies.

"Almost all the community gardens developed by GTGA are still active," said Adrio. "A lot of that is due to the persistance of the neighborhood leaders, and to our one-on-one contact with them."

Education is a primary goal of GTGA. Working with the St. Louis Public Schools and the School Partnership Program, with the assistance of the Master Gardeners, GTGA has developed 20 school gardens where children can learn gardening techniques. "We get more requests for school programs than we can fill," said Adrio. "Recently we received a grant to help our volunteers build indoor "grow labs," to serve classrooms where outdoor plots are not available. We provide a curriculum for teachers along with the labs, and the Garden will offer teacher training workshops."

In another exciting new project, GTGA received a grant to establish composting sites in city neighborhoods. The sites will provide free compost and instructional literature donated by the city.

"Working with the Urban Gardening Coalition is a great way to reach more people," said Adrio. "We publish a joint newsletter, expand our network of volunteers and resources., and on Earth Day we are combining forces on a display in Forest Park. Eventually I hope we can get involved with creating pocket parks, flower boxes, even tree planting."

"GTGA gets great results for a very small investment," Adrio concluded. "School groups, churches,and community groups all get involved in taking positive steps to build neighborhood pride. We like to call it 'the Greening of St. Louis.' "

Raven To Help Establish National Biological Survey

IN MARCH, United States Secretary of the Interior Bruce Babbitt announced that Dr. Peter H. Raven, director of the Garden, will help to set up a national biological survey to map the country's ecosystems and biological diversity. The survey will be headed by Raven and another of the nation's best known conservation biologists, Dr. Thomas E. Lovejoy of the Smithsonian Institution.

Dr. Raven will chair a National Research Council committee that will lay out the scope and mode of operation of the national biological survey. The committee's report will be issued in the fall.

"This is truly a historical moment," said Raven. "It is similar in importance to when the U.S. Geological Survey was initiated over a century ago. The proper management of the plants, animals, fungi and microorganisms of the United States, including commercialization, study, education and conservation, is a matter of great importance for the future stability and economic prosperity of the country."

The survey will produce a computerized picture of the nation's biological diversity that will constantly evolve as ecological situations change and information is added. The results will help researchers to identify the most fragile and threatened regions, to diagnose problems earlier, and take action before plants or animals become endangered.

With access to detailed, accurate information, conservationists and land use managers can create ecosystem protection plans, flexible ways of protecting fragile species in a comprehensive way without conflict between economic and environmental interests.

Peter Raven has been calling for such a survey for the past 15 years. He said, "Each species is an important component of essential biodiversity, the foundation of life on our planet. The Flora of North America program, headquartered at the Missouri Botanical Garden, is a key element in understanding these organisms and could provide an important model for components of the survey."

The survey will be administered by a reorganized, consolidated Department of the Interior. The core of the survey will be the existing research division of the U.S. Fish and Wildlife Service.

Raven concluded, "A comprehensive national biological survey and an ecosystem approach will allow us to make decisions that will really serve our best interests, both now and in the future."

Calendar

may 1 & 2 saturday & sunday

Metropolitan St. Louis African Violet Council

9 a.m. to 5 p.m., Orthwein Floral Display Hall. The 39th annual juried show and sale. Free with Garden admission.

may 7 friday

Step Out With Mom

Noon, under the outdoor tent, Ridgway Center. (Seating begins at 11:50 a.m.) Spring fashions by Plaza Frontenac, exquisite floral decorations by Moynihan & Associates. $35 per person for members; $45 per person for non-members. Call 577-9500 for reservations.

may 8 saturday

O'Fallon Iris Society Show

Noon to 5 p.m., Orthwein Floral Display Hall. Over 300 entries in a juried show and sale. Free with Garden admission.

may 9 sunday

Greater St. Louis Iris Society Show

Noon to 5 p.m., Orthwein Floral Display Hall. A juried show and sale featuring large bearded irises, both arrangements and individual blooms. Free with Garden admission.

may 12 wednesday

"I Love Eating" Cooking Class

11 a.m., Kemper Center for Home Gardening. Healthy low fat eating taught by dietitians and local food experts, in association with the American Heart Association, St. Louis Chapter. Call the AHA for information or registration at 45- HEART. Admission to the Garden is free on Wednesdays until noon.

may 28 friday

Rose Evening

5:30 to 8:30 p.m., grounds. A very special annual Garden tradition returns, featuring the beautiful Gladney and Lehmann rose gardens. Garden horticulture staff will be on hand to answer questions on rose care. The evening includes music, a free rose care brochure, a film on growing and care of roses, and an optional buffet supper. Watch the mail for your special invitation. For members only.

may 15 & 16 saturday & sunday

Greater St. Louis Horticulture Society Show

Noon to 5 p.m. Saturday, 9 a.m. to 5 p.m. Sunday, Orthwein Floral Display Hall. Vegetables and cut flowers are among the categories that will be judged and displayed. Free with Garden admission.

may 23, 24 & 31 sunday, monday & memorial day

Greater St. Louis Dahlia Society Plant Sale

9 a.m. to 5 p.m., Orthwein Floral Display Hall. Annual sale includes recent introductions and old favorites. Free with Garden admission.

may 26 wednesday

"I Love Eating" Cooking Class

11 a.m., Kemper Center for Home Gardening. See May 12 for details.

may 31 memorial day

Summer Hours Begin

9 a.m. to 8 p.m. daily through Labor Day. Visit the Garden and enjoy the tranquility of the early summer evenings.

may 29 & 30

saturday & sunday

Rose Society of Greater St. Louis Show

Noon to 5 p.m. Saturday, 9 a.m. to 5 p.m. Sunday, Orthwein Floral Hall. Hundreds of roses grown especially for this juried show will be displayed. Free with Garden admission.

june 2 wednesday

Jazz in June

7 p.m., Cohen Amphitheater. This popular outdoor concert series features some of the area's finest jazz bands. Lawn seating; blankets and lawn chairs are encouraged. Picnic suppers are permitted, and a cash bar will be available. Tonight's concert features the St. Louis Jazz Repertory Quintet. Admission to the Garden is free on summer evenings. Concert admission is $3 per person.

june 6 sunday

Garden Tour

10 a.m. to 4:30 p.m. Visit nine of the loveliest private gardens in St. Louis. Watch for your invitation in the mail; a special event for Garden members only. See back cover.

june 9 wednesday

Jazz in June

7 p.m. Featuring Trio Tres Bien. See June 2 for details.

"I Love Eating" Cooking Class

11 a.m., Kemper Center for Home Gardening. See May 12 for details.

june 12 saturday

Greater St. Louis Iris Society Show

Noon to 5 p.m., Orthwein Floral Display Hall. A juried show and sale featuring large bearded irises, both arrangements and individual blooms. Free with Garden admission.

june 16 wednesday

Jazz in June

7 p.m. Featuring Hugh Whalum "Peanuts" Trio. See June 2 for details.

june 19 saturday

Members' Opening, New Conservation Center

10 a.m. to 3 p.m., Conservation Center. Tour the newest Garden facility housing the Horticulture Division, Answer Service, Center for Plant Conservation and more. Free, for members only.

june 20 sunday

Open House, New Conservation Center

11 a.m. to 4 p.m., Conservation Center. Ribbon cutting ceremony at 1 p.m. The newest Garden facility is open for public tours, today only. Free admission.

june 23 wednesday

Jazz in June

7 p.m. Featuring Darryl Mixon Trio. See June 2 for details.

Members' Days

may 14 friday

Purple Martin Evening

6:30 p.m., Shoenberg Auditorium and grounds. Our 12th annual celebration of these popular birds features a lecture and film with the Curator of Purple Martins, W. Ashley Gray III, followed by a stroll through the Garden's Purple Martin neighborhood.Cash bar. Nor reservations are required, but seating for the film is limited. Free, for members only.

june 18 friday

Members' Musical Evening

5:30 to 9 p.m., Spoehrer Plaza. The popular Gateway City Big Band performs your favorite songs and instrumentals under the stars. Bring a picnic supper if desired, and lawn chairs or blankets for seating. Cash bar. Concert starts at 7:30 p.m. Limited concert seating is provided. Free, for members only.

june 27 sunday

West County Daylily Society Show

Noon to 8 p.m., Orthwein Floral Display Hall. A colorful display of summertime favorites. Free with Garden admission.

june 30 wednesday

Jazz in June

7 p.m. Featuring Rob Block Latin Jazz Sextet. See June 2 for details.

"I Love Eating" Cooking Class

11 a.m., Kemper Center for Home Gardening. See May 12 for details.

wednesdays & saturdays

Garden Walkers' Breakfast

7 a.m., grounds. In cooperation with the American Heart Association, the outdoor grounds open early every Wednesday and Saturday morning to encourage fitness walking. A heart-healthy breakfast is available for purchase in the Gardenview Restaurant 7 to 10:30 a.m. Admission is free Wednesdays and Saturdays until noon.

New! Free Walking Tours Every Day

1 p.m. daily throughout the spring and summer, rain or shine. Meet the Garden Guides at the Ridgway Center ticket counter for a fascinating tour of the Garden grounds. Guides are knowledgeable about all aspects of the Garden, including the architecture, history, horticulture, natural sciences, sculpture and trees. Free with regular Garden admission.

Members

Garden Admission Increases, with Additional Free Hours

On March 30, 1993, the Metropolitan Zoological Park and Museum District approved an admission increase at the Missouri Botanical Garden as recommended by the Botanical Garden Subdistrict. As of April 15, 1993, admission at the Garden is $3 for adults (up from $2 per adult), $1.50 for visitors 65 years and older (an increase of $.50 per senior citizen). Children aged 12 or younger will continue to be admitted free at all times. Group rates for 15 or more are $2.25 for visitors 13 to 64; seniors 65 and older in groups of 15 or more would pay $1.25.

The Garden will be providing additional free periods along with the increase. Starting with the 1993 summer season, from Memorial Day to Labor Day, the Garden will be free to the public on Monday through Thursday, 5 p.m. to 8 p.m. The Garden will retain its two free mornings, Wednesday and Saturday, when all are admitted free from 7 a.m. until 12 noon. This increases free hours from 10 hours to 22 hours per week. "Of course our Garden members continue to receive complimentary admission," said Brenda Banjak, membership coordinator. The increase, which will raise approximately $190,000 in 1993, was necessary to help offset growing operational costs.

1993 MEMBERS' TRAVEL PROGRAM

Oregon Trail Nature & History Tour

June 16 to 27, 1993

Austria, Alsace and the Rhine Valley

August 10 to 23, 1993

Each of these tours offers Garden members a thrilling travel adventure. For a brochure and complete information on cost and deadlines, please call Brenda Banjak at (314) 577-9517.

Don't Forget!

"Step Out With Mom"

Luncheon in honor of Mother's Day, Friday May 7, 1993. Reservations are $35 per person for members, $45 per person for non-members. See the invitation mailed recently to all members, or call 577-9500.

Also --

We especially wish to thank Moynihan & Associates for the exquisite centerpieces and tent decorations, and Plaza Frontenac for presenting the fashion show. Their generous contributions make the Mother's Day Luncheon a very special event.

News from Tower Grove House

Profile *Madeline Donaldson*

In March Madeline Donaldson celebrated 20 years on the Garden staff. Madeline volunteered as a guide at Tower Grove House in 1969; in 1973 she became a part time staff member. Two days a week she greets visitors to Henry Shaw's country home.

A native of Kansas City, Missouri, Madeline came to St. Louis with her late husband, Ben L. Donaldson, a representative for Parke-Davis Pharmaceutical Company. The Donaldsons lived in Dallas and Amarillo, Texas, and in Denver, Colorado, before moving to St. Louis. Madeline's daughter, grandson, and two great grandchildren live in Texas.

She especially enjoys introducing visitors to Tower Grove House because, she says, it is not "a cluttered museum, but a warm, homey house of Henry Shaw's era."

New Smoking Policy The Garden has implemented a new policy prohibiting smoking in all Garden buildings, including the Gardenview Restaurant. Visitors are asked to refrain from smoking outdoors on Garden grounds as well.

Garden Marching Flowers to Perform May 9

The Missouri Botanical Garden Marching Flowers will participate in the Florissant Valley of Flowers Parade on May 9 beginning at 1:45 p.m. The parade will start from Conservative Federal and proceed down Rue St. Francois to St. Ferdinand Street.

The performing flowers are students from St. Louis Academy of Dance directed by Ms. Linda Green.

Reciprocal Garden Memberships

When planning your summer vacation, consider visiting any one of 120 other botanical gardens and arboreta throughout the country. You will receive free admission and special privileges, just as their members do when visiting the Garden. Call the Membership Office at 577-5118 for eligible gardens in your vacation area.

Douglas B. MacCarthy Chairs Henry Shaw Committee

IN JANUARY 1993, Douglas Blanke MacCarthy was named the new chair of the Henry Shaw Committee, succeeding Mrs. Walter Stern. The committee works with the Development Office to expand the Garden's group of upper level members and to encourage existing members to increase their level of support. Mr. MacCarthy has been an active member of the Henry Shaw Committee since 1990, and he and his family are longtime Garden supporters.

Mr. MacCarthy, a lifelong St. Louisan, is a vice president of Merrill Lynch in the Frontenac office. He is a graduate of St. Louis Country Day School and Princeton University. Active in community affairs, Mr. MacCarthy is a member and former president the board of directors of Missouri Citizens for the Arts and of the Forum and he serves on the advisory council of Talking Tapes for the Blind. He is a former president of the board of the Repertory Theatre of St. Louis, has served on the board of trustees of the Saint Louis Art Museum, and is a former president of the development board of St. Louis Children's Hospital, among other activities.

Mr. MacCarthy said, "I am enthusiastic about the future of the Henry Shaw Committee. We are working hard to develop personal contacts with prospects and we hope to expand the size of the committee to increase our ability to work closely with upper level members. I am very grateful to Nora Stern for her splendid work in continuing the Henry Shaw Committee's role in raising the necessary funds to pursue the Garden's mission."

The current members of the Henry Shaw Committee are: Patrick Ackerman, Mrs. Lucien R. Fouke, Jr., Charles W. Freeman, Mrs. August W. Hager III, Mrs. Robert H. Kittner, Ms. Julia Maffit Lamy, Mr. and Mrs. Walter G. Stern, Robert P. Tschudy, John K. Wallace, Jr., Mrs. Donald D. Wren, and Harry E. Wuertenbaecher, Jr.

Marcia Kerz, director of development for the Garden, said, "The Henry Shaw Committee is an invaluable part of the Garden's fundraising effort. The membership support and increased giving encouraged by the committee make possible many of the Garden's activities, and the personal contact with our members is very important. We are very grateful to Doug MacCarthy and all of the members of the committee for the generous gift of their time and hard work."

At left: Douglas B. MacCarthy

New Guides and Instructors Complete Training

The class of Guides and Instructors at the training session in the Japanese Garden

ON MARCH 25, 1993, 11 new Garden Guides and five new Volunteer Instructors met in the Japanese Garden for the final session of their intensive 10-week training course. The new volunteers join 55 other Guides and 17 other Instructors who lead educational tours and classes at the Garden.

The Guides and Instructors are a vital part of education for all age groups at the Garden. In addition to their introductory training, these dedicated volunteers take regular enrichment programs to help them with the workshops, lectures and guided tours they give for children and adults all year long. As the Garden gears up for spring visits by school groups, each new Guide or Instructor can expect to work with 24 classes, or just over 500 children, between April 1 and the end of June.

Sandra Rode of the Education Divison said, "The generosity, creativity and knowledge of these volunteers will underline both the beauty and scientific value of the Garden. We thank them and their trainers, Pat Bushman and Janne Niemoeller, for the continuing gift of their time and enthusiasm."

Above (front row, from left): Doris Rahn, Lorraine Thomas, Marie Grzesiowski, Joyce Nusbaum, Joyce Fritze, Pat Bushman, Shirley Walsh, Janne Niemoeller, Sharon Kreitner, Marion Steefel, Dorothy Hohenberger. Back row, from left: Stan McLean, Ted Dettmann, Carol Donelan, Ray Kirkman, John Viviano, Judy Brennan. Not pictured: Elisabeth Diemar, Martha Gersten.

Jorge V. Crisci

LIKE ALL OF OUR BOTANISTS, Dr. Jorge V. Crisci, an Honorary Curator of the Missouri Botanical Garden from the National University of La Plata in La Plata, Argentina, is trained in systematic botany. His interests have led him beyond the traditional monographic approach to botany, where scientists take a group of plants and learn everything they can about them. He has become a specialist in analyzing patterns of relationships among plants, working since 1968 in the dynamic new field of phylogenetic systematics.

Jorge Crisci

Phylogenetic systematics is the name of a powerful new method of analyzing similarities among organisms, and ultimately of classifying them. This method generates objective, testable hypotheses about relationships among species, genera and other groups of plants and animals. The final product is a phylogeny, a sort of historical geneology. For hundreds of years, botanists have relied on personal and often subjective interpretations of the visible characteristics of plants to classify them. The phylogenetic approach, especially when combined with exciting new techniques from molecular biology such as DNA sequencing, is revolutionizing the way systematists work.

Since it is impossible to learn everything about every plant group, many scientists believe it is best to study one group in depth in order to develop ideas about plant evolution that can then be tested on other groups. Crisci heads a group of biologists in Argentina. "We look at the historical relationships among plants," he says. "We are trying to come up with a family tree for Onagraceae."

Onagraceae, the evening primrose family, has turned out to be a good group for such in-depth examination. Studied by the Garden's director, Peter Raven, for 35 years, the family, with more than 650 species, is the most thoroughly studied plant family of its size. Together with Crisci and other research biologists around the globe, Garden botanists have made the Onagraceae a model for the understanding of plant evolution. Using that model, botanists can seek answers to questions about how species form, how they relate to one another, how pollination systems evolve, and the like.

In the 1960s, while at Stanford University, Peter Raven studied the pollination systems in Onagraceae and, with his colleague Paul Ehrlich, developed theories about plant population biology. These theories have shaped our understanding of how plant species are defined, and how they evolve.

Six years ago, Crisci spent a year working at the Garden, and since then has been coming here two months out of every year. His major collaborator during his visits at the Garden is Dr. Peter Hoch (see this page, at right). "My visits are very useful for me and everyone in my lab," he says. "Every time I come here I learn a great deal. My visits give me access to the Garden's library and other resources. It is an extraordinary opportunity that I am grateful for."

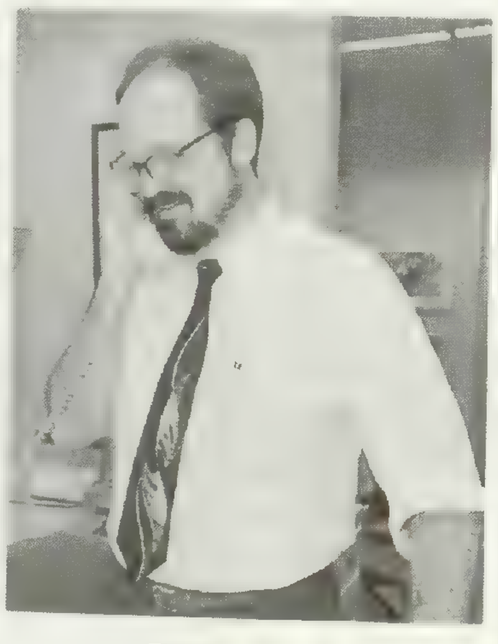
Recently, Crisci's activities at the Garden have expanded beyond the Onagraceae research. He is working with other Garden staff members applying his research methods to other plant groups.

In addition, he recently taught an intensive three-week course on phylogenetics for Garden graduate students at the University of Missouri-St. Louis (UM-St. Louis) and Washington University. The students raved about his teaching. "We feel that Dr. Crisci's teaching skills are exemplary," many of his students wrote in a memo to Dr. Albert Derby, chairman of biology at UM-St. Louis. "His full mastery of the material, especially the theory of phylogenetic systematics, allows him to present many difficult concepts in a very clear and comprehensive manner...We hope Dr. Crisci's course becomes an integral component of the standard curriculum in our graduate program."

Peter C. Hoch

DR. PETER HOCH, the Garden curator who is Jorge Crisci's major collaborator, was a student in the last course Peter Raven taught at Stanford University. Hoch was a Classics and English major at Stanford, which he says has helped him as a botanist. "Communication is exceptionally important in any work," he says. "Having a broad background, which included a great deal of writing, has certainly been a plus."

When he decided to pursue a graduate degree in botany, he chose Washington University so that he could work with Dr. Raven, who had helped and encouraged Hoch when he was an undergraduate. Hoch joined the Garden's staff in 1977, shortly before being awarded his degree in early 1978.



Peter Hoch

Soon after his arrival at Washington University, Hoch got a taste of the tropics through a course with the Organization for Tropical Studies in Costa Rica. His love for field work and plant collecting, along with his desire to work with Dr. Raven, steered him toward a degree in systematic botany and the plant family Onagraceae.

Hoch saw an immediate need for the study of the largest genus of Onagraceae, *Epilobium*. This genus has some 160 species and is well known in northern parts of North America for its most common member, the colorful fireweed. "*Epilobium* posed a number of interesting biological questions, such as what has driven the evolution of so many species. Taxonomically, it presented some great challenges," he says. Being a native of Colorado, he also enjoyed the opportunity to do field work in the Rockies.

Hoch currently works on phylogenetic studies of Onagraceae (see story at left). Since Onagraceae is such a well-studied plant family, a great deal of information has been generated about it. "Right now we're trying to understand a lot of the information that has been produced through the years. We're pulling all the information together to explain in a much deeper sense how we've gotten the species we've gotten, how species have evolved. We want to take the hypotheses developed by molecular systematists and test them. It is very exciting."

As a senior graduate student at the Garden, Hoch helped to guide other graduate students. After a few years on the Garden staff, he took formally took charge of the graduate student program and supervised it for eight years until 1991, when Dr. Mick Richardson was named head of the department. Hoch is still involved with some graduate student projects. Hoch met his wife Gloria in 1978 when she worked in the Garden's herbarium. They were married in 1980 in the Japanese Garden.

He is happy to have been affiliated with the Garden for the past 15 years. "The Missouri Botanical Garden is the most exciting place for the kind of botanical work that we do. There is really no place like it, and I've met so many interesting characters here."

(From left): Dr. Kodzo Gbewonyo, Bioresources International; Dr. Gordon M. Cragg, National Cancer Institute; Dr. Steven C. Price, Iowa State University; Dr. Robert Horsch, Monsanto Company; Dr. James S. Miller, MBG; Dr. Robert P. Adams, Baylor University.

DNA Bank-Net Considers Intellectual Property Rights

WHO SHOULD PROFIT when a plant produces a commercially viable product? The collector of the plant? The government of the country in which the plant was collected? The drug or biotech company that produces the product? Some combination of the three? These are among the questions that were considered at the second meeting of the DNA Bank-Net, held April 5-7, 1993, at the Garden.

More than 50 scientists attended the meeting. The DNA Bank-Net is a consortium of plant biologists that was formed to gather and store DNA-rich plant materials for future academic research and plans to explore potential future commercial applications. The group came together at their first meeting at Kew Gardens in England in 1991. It is the brainchild of Dr. Robert P. Adams of Baylor University, the main organizer of the meeting.

The April 5 international symposium on intellectual property rights and plant materials was organized by Dr. Adams and Dr. James Miller, who leads the Missouri Botanical Garden's Natural Products Research Program. The symposium examined existing models for programs that collaborate to produce new medicines or biotech products from plants and the rules that should govern their ethical operation.

"For drug discovery and agricultural programs to be successful, the developing countries with the richest biodiversity must receive an equitable share of the profits," said Dr. Miller. "Meetings such as this help to ensure that we deal with these issues fairly in the future."

The meeting also included symposia on gene amplification and utilization, utilization of DNA from herbarium, sub-fossil and fossil materials, and a special mini-symposium on plant conservation and storage in developing countries.

GARDEN GATE SHOP

Mother's Day Is May 9

Just in time for Mother's Day, the Shop has a lovely selection of gift books. *In My Mother's Garden*, Gibbs Smith, $10.95, is a delightful blend of poetry and beautiful illustrations. On the lighter side, *My Mother is the Best Gift I Ever Got*, Random House, $8.00, presents observations by children; for example, a nine-year-old who says, "Mothers are more important than the President because they make laws at home that you really got to obey."

There are also gifts that pamper: fragrant soaps and bubble bath, mud packs and back scrubbers, all made of natural ingredients. Make your own gift basket full of personal care items and beautiful blooming plants.

Father's Day Is June 20

For Dad, check out the Shop's selection of silk ties, outdoor statuary, bird houses and some of the best garden tools in town, including Felco pruners and Scott's adjustable tools, plus gardening hats and gloves.

And don't forget -- a Garden Gate Shop Gift Certificate for Mom or Dad is always welcome.

Landmark Publications by Garden Scientists

A Field Guide to the Families and Genera of Woody Plants of Northwest South America

By Alwyn H. Gentry
Conservation International
895 pages, 291 illustrations.
$25.00

This field guide, written by a Garden curator who is one of the most distinguished research scientists in tropical botany, is the first ever to deal with the extraordinarily diverse flora of Colombia, Ecuador and Peru. Drawing on his extensive experience exploring these regions, Gentry presents a new approach to the identification of tropical plants.

Dr. Peter H. Raven, director of the Garden, said, "This beautiful book represents a landmark event in dealing with the trees, shrubs and lianas of this area, which is biologically the richest on earth. It reflects a depth of field knowledge that is unparalleled, and it will make a permanent and important contribution to our understanding of these plants."

Environment

By Peter H. Raven, Linda R. Berg, and George B. Johnson
Saunders College Publishing, Harcourt Brace Jovanovich College Publishers
670 pages, illustrated. $52.00

This splendid new textbook on environmental science will be invaluable to anyone interested in how the world works and what is happening to it as its human population expands. The authors synthesize the fundamental issues in a readable and beautifully illustrated text that stresses knowledge as a key to dealing with our future intelligently.

Environment presents the concepts of ecology as a starting point for the study of environmental science. The text is enhanced by stunningly beautiful graphic illustrations and photographs. It focuses on the issues and dilemmas environmentalists must consider, encourages effective, thoughtful problem solving, and challenges students to take an active, positive role.

CLIFF WILLIS

PROFILE

Stephen E. Wolff

On April 8, Steve Wolff, the Garden's production floriculturist, celebrated his 25th anniversary as a Garden horticulturist. During this time, Wolff has watched Garden history unfold.

"The last 25 years have been like a Golden Age or renaissance for the Garden and I feel privileged to have been a part of it," he says. One of the first things Peter Raven did when he became director of the Garden in 1971 was to have a master plan for the Garden designed. "The master plan got it all started," says Wolff. "We could plan things out and have a goal to shoot for."

Wolff was hired by the Garden as a high school senior. He continued to work while pursuing his horticulture degree at Meramec Community College. During these early years he worked with some of the horticultural giants whose names are familiar to those who have studied the Garden's history: Paul Kohl, Lad Cutak and George Pring, among others.

"These men were my teachers and mentors," Wolff says. "They dedicated their lives to the Garden and that dedication rubbed off on me."

During his first seven years in the horticulture department, Wolff worked in a variety of areas around the Garden, both inside and out. In 1975 he decided to pursue a career in greenhouse work, because he found it to be the most challenging and rewarding. As production floriculturist, Wolff is responsible for producing plants for the Garden's indoor flower shows as well as outside displays. Timing and scheduling are everything in his job. "In the greenhouse you are under the gun; you are working with a schedule since plants have to be ready at a specific time. You also have to keep up with the field -- things have changed so much in the past 25 years."

Another rewarding aspect of his job is producing the flowers for the annual Flower Festival at Christ Church Cathedral. Henry Shaw's Will stipulated that money be donated to Christ Church Cathedral for an annual sermon on "the wisdom and goodness of God as shown in the growth of flowers, fruits, and other products of the vegetable kingdom." Since the 1930s, the Garden has also been filling the church with flowering plants for the Flower Festival. The plants are sold afterward and the money donated to charity. Last year, Wolff was honored by Christ Church Cathedral for "his 22 years of caring devotion and faithful service to the annual Flower Festival."

Having been employed here since the age of 17, the Garden has played a major role in Wolff's life, both professionally and personally. Wolff's wife, Doris, was an herbarium assistant, and Wolff first met her while he was mowing near the Lehmann Building. They married in May of 1975 and from 1976 to 1979 they lived in a small cottage on the Garden grounds which has since been removed. "Our second child was born while we lived on the Garden grounds. It was literally our kids' backyard," he says with more than a trace of nostalgia.

His fellow employees and volunteers have helped make his time at the Garden memorable. "I remember the days when I was the young kid and I had to show the older guys that I had what it takes to work at the Garden. Now that I am older I have to show the young guys that I still have what it takes. Our horticulturists are very knowledgeable and I am always learning a great deal from them. I also try to take what I learned from the older guys and pass it along to the younger folks who are interested."

Wolff is proud to be a horticulturist. "The flowers I help produce for the shows or for outside displays make people's lives that much more enjoyable. I think horticulture is a noble career. It keeps my batteries running."

RICHARD BENKOF

MAKING THE FIRST ENTRY-- Shown in the Spink Gallery are avid staff birders (from left) Barbara Addelson, Claudia Spener, and Dr. Mick Richardson, with Phoebe Snetsinger, at right.

New Nature Registry

Visitors to the Garden always notice the wildlife: a variety of squirrels, insects, and birds are attracted to the habitats created by the plantings on the grounds. Now visitors can share their observations by recording them in a beautiful new book located in the Spink Pavilion in the Ridgway Center.

The Nature Registry was handmade by Vicki Lee, the book conservator in the Shoenberg Conservation Center in the Garden's Library. The handsome ledger provides space for visitors to record their sightings of birds and other wildlife on the grounds of the Garden and Tower Grove Park.

"May is a big month for bird migration, and there is a lot of activity here," said Barbara Addelson of the Garden's Education Division. An avid birder herself, Barbara explained that "there is also a lot of concern because the tropical rain forests that serve as the winter homes of many of our North American breeding birds are being destroyed. Scientists are noting a decline in the populations of a good

continued on next page

A NEW LOGO DESIGN

Flora of China

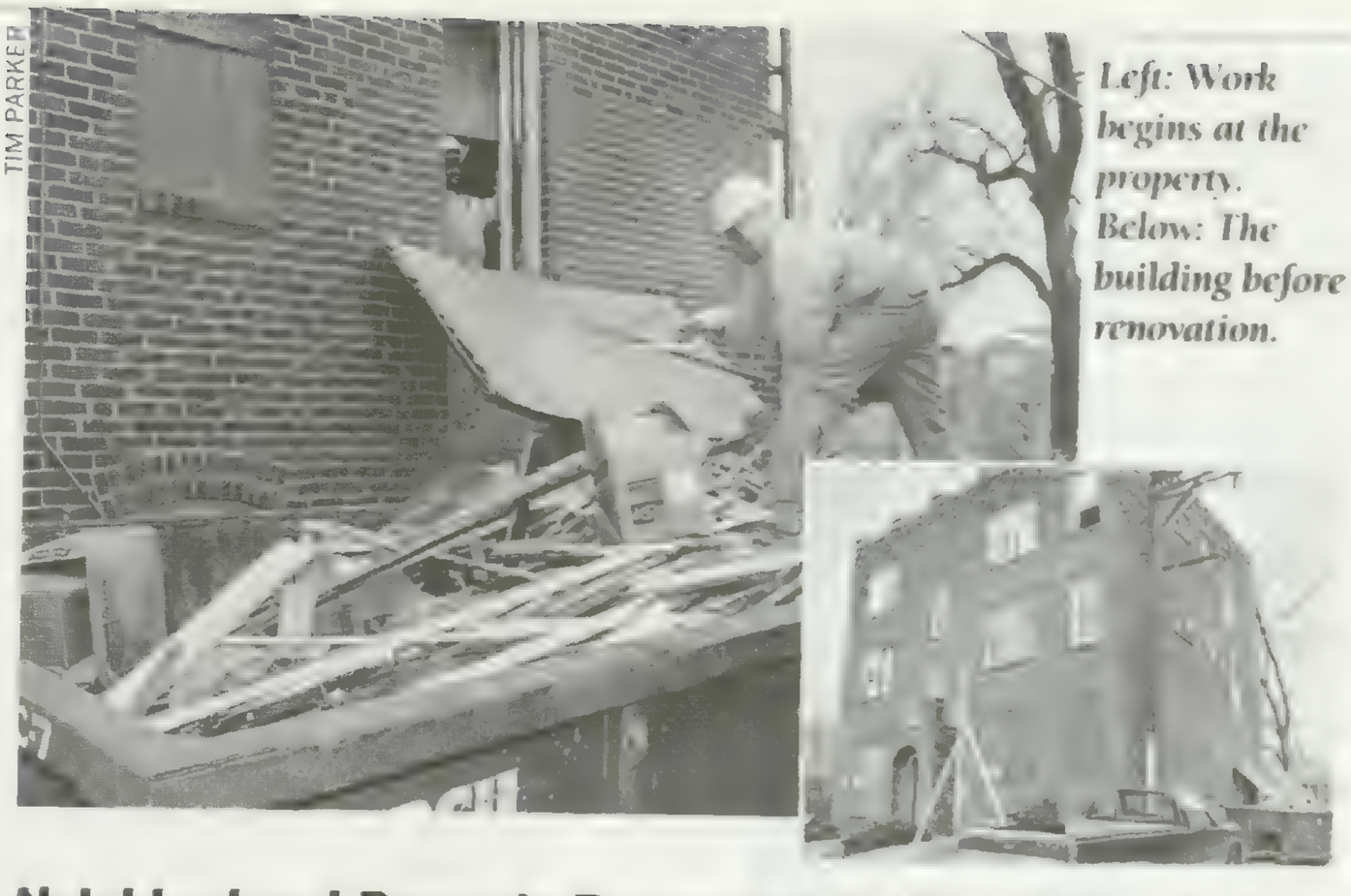
THE NEW LOGO for the *Flora of China* project, shown at left, was designed by Charles P. Reay, a senior vice president at Hellmuth, Obata & Kassabaum of St. Louis. Mr. Reay also designed the Garden's familiar logo.

The *Flora of China* logo was developed from a group of nested leaf forms. All of the leaves except the *Ginkgo* belong to genera that exist in both China and North America, representing the similarities of the forests that once convered both lands and symbolizing the Sino-American collaboration on the project.

Two leaves of *Rhododendron* form the base of the logo. Upon them rests a *Ginkgo biloba* leaf. The curve of the *Ginkgo* leaf is reflected in its counter, a line that describes the upper of the three lobes of the leaf of the Chinese sweet gum, *Liquidambar acalycina* Chang. A leaf of the latter is completed by the horizontal lines reaching outward to the edge of the logo and by the curved half circle of the base. The leaf of the tulip tree *Liriodendron* forms the outer line of the logo. A leaf of the American sweet gum, *Liquidambar styraciflua*, rests within the others. Its upper lobe is formed in the inverted V-shape that rests on the *Ginkgo* leaf. Its two middle lobes are drawn by the horizontal line and the two inward-moving curved lines. Its lower lobes are coincident with lines describing the *Rhododendron* leaf.

Chip Reay said, "The leaves go from those which are simple to those of increasing complexity. This progression—one, two, three, four, five—suggests the growth and expansion of knowledge in systematic botany. In the complexity of the form there is truth: the deeper we look, the more we will find."

TIM PARKER



Left: Work begins at the property. Below: The building before renovation.

Neighborhood Property Renovated for Guest Housing

It may not look like much in this photograph, but by late spring this building will be completely rehabbed as six, two-bedroom guest apartments for the hundreds of scholars, students and interns that visit the Garden to participate in horticulture and research programs each year. For the past twelve years the Garden has temporarily rented a series of apartments for these visitors. The rehabbed unit will simplify property management for Garden staff and provide a central facility for our guests. The unit is located one block west of the Garden, making access easy, since most guests do not have cars. Further, the Garden's use of the building in this way reduces the number of cars parked on the neighborhood's streets. The rehabilitation is being carried out in close cooperation with neighborhood organizations and is sponsored by Southwest Housing Corporation in association with Operation ConServ, Operation Impact, and the Community Development Agency.

New Nature Registry *continued*

number of our migratory birds."

The Nature Registry was suggested by Peter Raven in conjunction with the publication of the guide *Birds of Missouri Botanical Garden and Tower Grove Park*, which is available in the Garden Gate Shop for $1.95. Spink Gallery is open to visitors from 9 a.m. to 5 p.m. daily.

A World Champion Birder Makes First Entry

THE VERY FIRST ENTRY in the new Nature Registry was recorded by Phoebe Snetsinger, a resident of Webster Groves and longtime Garden member who is well known in birding circles for having sighted a record-setting number of species. Her lifetime list stood at 7,300 the last time she counted, making her one of the top birders in the world.

"I started when my children were young," Phoebe said, "and I take several trips a year to look at birds. It takes a lot of study and preparation."

Phoebe's travels have taken her all over the world, to exotic and sometimes nearly inaccessible locations. She has observed birds in Africa, Micronesia, South and Central America, and is headed for Kenya next. On a recent expedition in New Guinea, she and her companions were nearly killed when a boat overturned several miles from shore. But perhaps her most exciting adventure was in 1983 in St. Louis, when she and two companions made the first sighting of a Slaty-backed Gull in the lower 48 states.

"I have always been more interested in learning about birds than in just making sightings," Phoebe said. The Garden hopes to encourage that enthusiasm for learning about the natural world by inviting Garden visitors to add to the new Nature Registry.

Naturalists' Adventure in Tropical Belize and Guatemala

Tour members visit the rain forest.

IN FEBRUARY, the Garden sponsored a trip to Belize and Guatemala. Twenty-eight St. Louisans and three Garden staff from the Education Division spent 11 days in these two Central American countries. The group explored tropical habitats, investigated medicinal plants, watched exotic birds, climbed on 1000-year-old Mayan temples, canoed down tropical rivers past bat colonies hanging from limestone cliffs, hiked around mangrove swamps, and snorkeled among the coral reefs of the Caribbean.

Many interesting plants and animals were observed on visits to two of Belize's wildlife sanctuaries, both examples of successful tropical preservation: Crooked Tree Wildlife Sanctuary, a wetlands area that is home to thousands of species, and the Community Baboon Sanctuary, a rain forest sanctuary for black howler monkeys preserved through the cooperation of land owners and conservationists.

Several days were spent exploring the tropical pine forests of the Maya Mountains with its magnificent 1000-foot falls and Rio Frio Cave. In these forests, bromeliads and orchids hang from the branches of pine trees, while tree ferns grow on the forest floor. Another highlight of the trip was a guided tour of the Mayan Medicine Trail, where everyone was able to hear about Maya folk medicine and see many of the important tropical plants from which medicinal products have been derived.

In Guatemala the group climbed to the top of 2000-year-old Mayan temples at Tikal, an incredible ancient city surrounded by rain forest left undisturbed for several hundred years. The trip ended with several days on Ambergris Caye, an island near the Belize barrier reef. Snorkeling trips to watch thousands of colorful fish feed near the coral reef were included along with explorations of tropical mangrove swamps.

The Missouri Botanical Garden is planning other exciting trips to tropical Central and South America. Please be sure to watch future issues of the Bulletin and the adult education brochure for information about these learning opportunities.

New Stream Ecology Book Published

The Garden has published a new book for teachers and students, Stream Ecology: A Journal for Action, by Jeffrey C. DePew, coordinator of the Henry Shaw Academy, with editorial assistance by Susanne F. Reed and Jennifer L. Gleason of the Garden's Education Division. Illustrations were prepared by Angela Naughton and Lori Carl. Susanne Reed was the designer.

The book is intended as a resource guide, as a curriculum for classes, as a journal for students to record their ideas, information and analysis of collected data, and as a model for teachers to use and adapt for their own field classes. Amateur naturalists, teachers, state officials, administrators, conservationists, students, or anyone interested in learning about or preserving aquatic resources and wetlands will find Stream Ecology invaluable.

The book is based on the Stream Ecology Program of the Henry Shaw Academy. The year-long program was developed by Jeff DePew for students ages 13 to 14. Susanne Reed and Jennifer Gleason both have worked as assistants with the Henry Shaw Academy.

The 112 page book is lavishly illustrated and includes a number of fold-out pages with sample field charts. Copies may be ordered from the Education Division, Missouri Botanical Garden, P.O. Box 299, St. Louis, MO 63166-0299. Each copy is $15, which includes shipping and handling.

The forecast called for snow, and the Post-Dispatch Weatherbird wore a familiar face on February 24, 1993.

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Oral History Program Interviews S. E. Taylor

DR. S. ELWYNN TAYLOR, a professor of climatology and meteorology at Iowa State University, visited St. Louis this spring to recount his recollections of the Garden in the late 1960s to Eddie Rosenheim, who conducts interviews for the Library's Oral History Program. During his visit he delivered a lecture at the Garden on "Implications of Global Patterns of Climate Change."

Dr. Taylor was a graduate student at the Garden from 1966 to 1970, earning his Ph.D. in botany from Washington University. Dr. David Gates, then director of the Garden, was his advisor. After working as an agricultural meteorologist for the National Weather Service, Dr. Taylor joined the Department of Agronomy at Iowa State in 1979.

As a graduate student, Taylor worked extensively on glades at the Shaw Arboretum in Gray Summit. He took the course "Dynamics of the Landscape" from Edgar Anderson, a former director of the Garden, whose work he called "40 years ahead of its time."

In addition to a wealth of anecdotes, Dr. Taylor reminded us of the Garden's ongoing scientific accomplishments, including studies on the measurement of viruses, the pollination of yucca flowers by wasps, and the development of creosote, which involved "all these old telephone poles set into the ground where the Ridgway Center is now," he remembered. In addition, Dr. Taylor claims the distinction of having been the individual who first invited Peter Raven to visit the Garden, for a graduate seminar in the late '60s.

"Dr. Taylor's reminiscences illustrate the enormous value of the Oral History Program," said Constance Wolf, the Garden's librarian. "These interviews fill in gaps in our knowledge and give a human dimension to records and documents."

PROFILES

New Trustees Join Board

In January 1993 two new Trustees were elected to the Garden's Board for two-year terms.

The Honorable Carol E. Jackson

Carol Jackson is a United States District Judge for the U.S. District Court, Eastern District of Missouri. She was appointed a Magistrate Judge in 1986, and received her appointment as a District Judge in 1992.

A native St. Louisan, Judge Jackson is a 1973 graduate of Wellesley College and earned her law degree from the University of Michigan at Ann Arbor in 1976. She served as an adjunct professor at the Washington University School of Law from 1989 through 1991, was senior attorney for Mallinckrodt, Inc. from 1983 to 1985, and was an associate of Thompson & Mitchell law firm in St. Louis from 1976 to 1983.

She is active in community affairs in St. Louis, serving as an advisory commissioner to the Saint Louis Art Museum and working with Project Respond/Vision for Children at Risk. Judge Jackson is a member of the Missouri Bar, the Bar Association of Metropolitan St. Louis and the Mound City Bar Association.

"I have wonderful childhood memories that predate the Climatron, so I truly appreciate the extraordinary changes that have taken place at the Garden," said Judge Jackson. "As a nearby resident, I feel especially interested in learning more about the Garden's programs and services, and I hope I can make a contribution."

"We are very fortunate to have Judge Jackson as a member of our Board of Trustees," said Dr. Peter H. Raven, director. "We look forward to working with her and benefiting from her knowledge of the St. Louis community."

Carolyn W. Losos

Carolyn Losos has served St. Louis with distinction for many years. Since 1981 she has been executive director of Leadership St. Louis, now known as the Leadership Center of St. Louis, an organization that develops, promotes and inspires existing, emerging and potential leaders to bring together the resources required to solve problems and address issues affecting the quality of life in the St. Louis region.

A native St. Louisan, Mrs. Losos also serves on the board of directors of St. Louis Children's Hospital, the national board of Girl Scouts of the U.S.A., the Regional Arts Commission, the National Council for the Faculty of Arts and Sciences at Washington University, and the National Center of Parents As Teachers. She is a member or past member of many other St. Louis and national organizations.

Mrs. Losos shares her interest and concern with environmental issues with her entire family. Her daughter is an environmental ecologist with the Wilderness Society looking at a new approach to biodiversity and endangered species in the U.S., and her son is an evolutionary biologist on the faculty at Washington University. Her other two daughters are teachers.

"We have travelled all over the world to visit places of interest to conservationists," Mrs. Losos said. "We have visited Costa Rica, Madagascar, Kenya, the Central African Republic, Botswana; and everywhere we go people know about the wonderful work of the Missouri Botanical Garden. I am very interested in helping St. Louisans to understand the global scope of the Garden's work, and encourage them to make a commitment to the world's environmental concerns."

Carolyn Losos

She continued, "I feel very lucky to be on the Garden's Board. It is a jewel in the crown of our community."

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Mr. and Mrs. Gideon H. Schiller's tribute in memory of Mr. Bram Lewin was incorrectly listed in the last issue. We regret the error. —Editor

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recycled paper

1993 garden tour

Sunday, June 6, 1993
10 a.m. to 4:30 p.m.
Rain or Shine

Garden members are invited to visit nine of the loveliest private gardens in St. Louis.

finale party

Sunday, June 6, 1993
5:30 to 8:30 p.m.

Members are invited to celebrate the conclusion of a very special day with a spectacular party at a magnificent private home.

Watch the mail for your invitation, including tour costs, party fees, and registration for this special event for members only. Participation will be limited.

MEMBERS' SPECIAL EVENT

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Missouri Botanical Garden

JULY/AUGUST
1993

VOLUME LXXXI
NUMBER FOUR

Comment

Missouri Botanical Garden Environmental Policy

"The mission of the Missouri Botanical Garden is to discover and share knowledge about plants and their environment, in order to preserve and enrich life. Accomplishing this mission depends on the responsible management and conservation of the world's biodiversity. The quality of human existence depends on an environment that is healthful in all respects. For these reasons, the Garden places major emphasis on educating individuals to take responsibility for the overall quality of the environment. In addition, the Garden promotes public understanding of environmental issues locally, nationally, and internationally.

"Particular goals of the Garden's programs are the conservation of biodiversity, sound horticultural practices, international understanding and action, and the responsible use of all resources. The Garden emphasizes these goals in its own activities and encourages individuals and other organizations to do so as well."

The statement above was adopted by the Board of Trustees at their meeting on May 19, 1993. It is the result of many meetings and discussions, and long, careful consideration by Garden staff and our Trustees. Advocating sound environmental policies is important, and practicing them to the best of our ability requires an even greater commitment. As an institution we are pledged to take responsibility for our actions and to lead by example, and I look forward to our progress and to your continued support for our efforts. Future issues of the Bulletin will examine our initiatives in detail.

Summer is upon us, with a calendar filled with delightful activities for all ages. From "Kids in Bloom" to the Moonlight Stroll, from "Celebrate the Tropics" to the Japanese Festival, we hope that you and your family and friends will join us often. I especially encourage you to visit the beautiful new Whitmire Wildflower Garden at Shaw Arboretum in Gray Summit, a glorious addition to our displays and a celebration of our native plants.

— Peter H. Raven, Director

Raven Delivers Commencement Address at Washington University

Grand Marshall Burton Wheeler hoods Peter H. Raven as Washington University Trustee Sarah S. Wallace (center) and Chancellor William H. Danforth look on.

AT Washington University's 132nd commencement May 14, 1993, Peter H. Raven delivered the commencement address to approximately 2,300 graduating students. Dr. Raven, who holds the appointment as Engelmann Professor of Botany at the University, received an honorary doctor of science degree. Raven's address was titled "Attitudes and Alliances: Shared Dependencies and Responsibilities for the Environment."

The Garden shares a long history of collaboration with Washington University. The Garden's founder, Henry Shaw, endowed the Henry Shaw School of Botany at Washington University and specified that the Garden's director be a professor there. The school awarded its first doctorate in 1895. Today approximately 20 graduate students per year receive their training in botany at the Garden, in cooperation with Washington University, the University of Missouri-St. Louis, Saint Louis University, and Southern Illinois University at Edwardsville.

Other recipients of honorary degrees at the Washington University commencement were Russell L. Ackoff, Stanley Cohen, Stanley L. Lopata, Sybil C. Mobley, Joseph Pulitzer Jr., and Harold A. Ramis.

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Please remember to send us your new address.

To avoid missing any of your membership mailings, we need notification of your new address at least three weeks before you move. Please enclose the mailing label on the back cover of this *Bulletin* and mail to:

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On the Cover

The Linnean House
Photo by King Schoenfeld

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1993 Missouri Botanical Garden

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MISSOURI BOTANICAL

AUG 13 1993

GARDEN LIBRARY

RICHARD BENKOF

The exterior of the Center

Emerson Electric Co. Conservation Center Is Dedicated

RICHARD BENKOF

CLIFF WILLIS

SUNDAY, JUNE 20, 1993, the ribbon was cut officially opening the new Emerson Electric Co. Conservation Center on the west side of the Ridgway Center. The public was invited to tour the new facility.

The naming gift, made possible from a gift through the Emerson Charitable Trust, allowed the Garden to complete funding for the building and to meet a $500,000 challenge grant from the Kresge Foundation. The Center was designed by Mackey Mitchell Associates as a renovation of the 1965 Park Building and an 8,430 square foot addition on its north side. The energy-efficient, cost-saving building houses the Horticulture Division, the Horticultural Answer Service, the Center for Plant Conservation, and the Gateway to Gardening Association.

"This wonderful new building brings together staff working in programs with closely related objectives for conservation and community outreach," said Dr. Peter H. Raven, director. "We expect it to have local, national, and international dimensions, attracting scientists, horticulturists, and educators collaborating on the central issues driving the conservation movement."

The Garden wishes to thank all the other donors whose generous support helped to make the Center a reality, including: Boatmen's Bancshares, Inc.; Mr. and Mrs. Stephen F. Brauer; Mr. and Mrs. William S. Knowles; The Kresge Foundation; Maritz, Inc.; the Spencer T. and Ann W. Olin Foundation; PET Incorporated; Warren and Jane Shapleigh; Mr. and Mrs. Andrew C. Taylor; and the Members of the Missouri Botanical Garden.

Shown at the ribbon cutting ceremony are (fom left): The Hon. Patrick Dougherty, State Representative; Paul Ladensack of Mackey Mitchell Associates; Dr. Nancy R. Morin, assistant director of the Garden; and Dr. G. Shannon Smith, director of horticulture at the Garden.

RICHARD BENKOF

Above: An atrium skylight illuminates the central office space on the second level. Above, right: The former exterior stone wall of the old Park Building forms a handsome interior wall in the Center.

AFRICA AND MADAGASCAR

by Janine Adams

THE Missouri Botanical Garden is the leader in botanical research being conducted in Africa by U.S. botanical institutions. It serves as the North American center for the study of African botany and houses the nation's largest collection of plant specimens from Africa.

Garden scientists currently are working in Madagascar, Cameroon, Congo, Gabon, Ghana, Tanzania and South Africa. Projects in at least four other countries are pending. The Africa and Madagascar department is headed by Dr. Porter P. Lowry II, a Garden botanist based in Paris. The department has 17 full time botanists, several of whom are stationed abroad.

The Garden's work in Africa is growing rapidly. In 1991 the Garden signed a $1.2 million five-year contract with the National Cancer Institute to collect plants in Africa to be screened by NCI for potential anti-cancer and anti-HIV properties. This project, under the direction of Dr. James S. Miller, is opening new doors for the Garden in Africa. Through the NCI contract the Garden provides direct support for local botanical institutions in the countries in which it works. In addition, before doing any NCI collecting, the Garden has arranged a bilateral agreement with the country's government and NCI to ensure that the host country receives due compensation in the event that a new drug is developed.

This is the Garden's second five-year contract with NCI for Africa. One plant in particular, collected for NCI during the first contract, has produced promising results in the laboratory for anti-HIV activity (see story at right).

The Garden also has a large program in Madagascar, where it began working in 1972. Since 1983 Garden researchers have been conducting basic research and exploration of the island's poorly known flora and establishing a comprehensive database of the plants of Madagascar on a master plan for Parc Tsimbazaza, the botanical garden and zoological park in the country's capital, Antananarivo. The park will provide residents with the opportunity to learn about the importance of the unique plants and animals native to their country and serves as a center for botanical research.

As the Africa and Madagascar program grows, one of its most important aspects strengthening institutions and building cooperation among the various organizations, agencies and individuals operating in each country. "Every project we undertake in Africa has a conservation and a training component," Lowry continued. "Collaboration with our local counterparts is an integral part of all our activities, extending our reach far beyond what we can do with our staff working alone. We try to build the kinds of relationships that help to provide the people of each country with the resources they will need to carry on the study and to protect their natural heritage far into the future."

"We have a long term commitment as an institution in building a strong program in Africa," says Lowry. While Africa boasts fewer plant species than the Neotropics, the amount of attention they are currently receiving is far less than needed. The Garden is working to build the body of knowledge about African plants and to help Africa protect the plant life on which its people depend.

RICHARD BENKOF

Dr. George Schatz (left) and Dr. Porter P. Lowry II discuss their work in Africa and Madagascar.

AIDS *Garden Botanists Discover A Plant That May Lead To Treatment*

A POTENTIAL TREATMENT for AIDS is one step closer to reality due to the work of Missouri Botanical Garden botanists. One of the plants collected in Cameroon for the National Cancer Institute, a woody tropical vine that turned out to be an undescribed species of the genus *Ancistrocladus*, has shown promising activity against the AIDS virus in early laboratory tests.

Natural Products as Potential Cures

Plants are a major source of chemicals that can be useful to humans as drugs, pesticides, industrial materials and herbicides, but in many ways they are an untapped resource. While each of the 250,000 species of higher plants contains hundreds of chemical compounds, only a handful have been studied carefully. The Missouri Botanical Garden's natural products research program, under the direction of Dr. James S. Miller, is dedicated to searching for plants with interesting chemical compounds. While the Garden does not perform the chemical screening and isolation process, it is uniquely qualified to collaborate with pharmaceutical research groups, provide plant samples, and assist with the design of programs and data analysis.

DANIEL HARDER

***Fruits of* Ancistrocladus**

The National Cancer Institute program, which searches for new drugs to combat cancer and AIDS, has one of the world's most ambitious natural products screening programs. In 1986, the Garden entered into its first five-year NCI contract to collect 1,500 samples of

African plants each year for NCI screening. In 1991, the second five-year contract was signed. Working with local botanical institutions, Garden researchers collect plants in continental Africa and on the island of Madagascar. NCI also contracts with The New York Botanical Garden to collect in Latin America and the University of Illinois at Chicago to collect in Southeast Asia.

The Finding of Ancistrocladus

The first sample of *Ancistrocladus* was collected under the Garden's first NCI contract in 1987 by Dr. Duncan Thomas, as part of a large random sample from the Korup region in Cameroon. Thomas, together with Garden botanists Roy Gereau and Dr. Daniel Harder, has collected further samples for NCI screening. Michellemine-B, the active agent in the plant, has been approved for preclinical trials.

A large quantity of plant material will be required by NCI to conduct these tests. The vine is not rare in the areas where it grows, but it is found nowhere else. Therefore the Garden and NCI have elected not to collect the large quantities they need from wild sources, but to grow the plant as a crop in Cameroon instead. They have entered into an agreement with the University Center for Health Sciences in Cameroon to cultivate the plant. Garden botanists and horticulturists will assist in this effort.

Intellectual Property Rights

An important aspect of the search for new drugs in developing countries is the sovereign rights of the countries to their plant material and products derived from those plants. The Garden is very aware of these issues and, together with NCI, takes great care to ensure that the countries from which plants originate receive an equitable share of potential profits. Letters of agreement between the governments of these countries and NCI are signed before collecting efforts begin.

Field work and identification of specimens is conducted by teams of botanists from the Garden and the collaborating institution. Collaborating botanists also visit St. Louis to work directly with Garden researchers.

After the plant extracts are screened, NCI provides a summary of test results to the collection country. While the laboratory work is done at NCI labs in Maryland, NCI frequently sponsors scientists from collection countries to come to NCI to work in their labs.

DANIEL HARDER

Garden researcher Roy Gereau collecting plants in Tanzania.

Monsanto Company's Natural Products Screening Program

In addition to its collecting activities for NCI, the Garden works with Monsanto Company's Natural Products Screening Program. Monsanto contracts with field biologists all over the world to find plants and microorganisms that may provide leads for new medicines and agricultural products. The Garden's involvement with Monsanto began in 1988 when Garden botanists collected 500 soil samples a year from tropical regions, looking for novel soil microorganisms that might lead to new antibiotics. In the spring of 1990 the Garden added two more Monsanto programs, both for plant materials.

Natural Products and Conservation

Little is known about the plants of the world, particularly those in tropical forests, in terms of potential new medicines. Twenty-five percent of all medicines contain ingredients from plants, and many synthesized chemicals are modeled after chemicals found in plants. Tropical plants yield therapeutic drugs for hypertension, childhood leukemia, Hodgkin's Disease, malaria and many others. If

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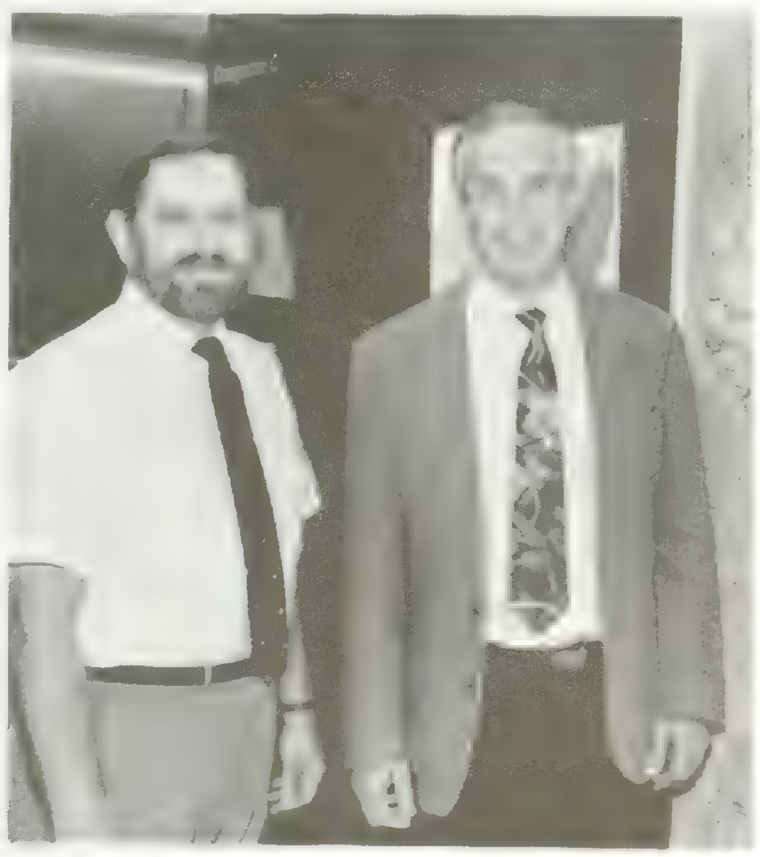
DANIEL HARDER

Dr. James S. Miller (left) examining plants in the field with Daniel Abbiw, a colleague from the herbarium of the University of Ghana.



CLIFF WILLIS

VISITING FROM SOUTH AFRICA—Shown in the Garden's herbarium are Dr. Robert E. Magill, head of the department of neotropical floristics at the Garden (left) and Dr. Brian J. Huntley, chief director of the National Botanical Institute of South Africa. Dr. Huntley was in St. Louis June 1-3, 1993, to meet with a number of the Garden's staff to discuss programs at the two institutions.

Debt-Swap in Madagascar Yields Funds for Research

ON MARCH 29, 1993, the Missouri Botanical Garden signed an agreement with Madagascar's Central Bank allowing the Garden to purchase up to $750,000 worth of Madagascar's international debt. The Garden will use the funds yielded by the debt-swap to finance its ongoing botanical research and conservation work in collaboration with local institutions in Madagascar.

ING Bank of Paris holds debt with the government of Madagascar, which the Missouri Botanical Garden purchased at a discounted rate of 50 cents on the dollar. The funds, up to $250,000 per year for three years, will be released to the Garden in local currency at the official exchange rate and are thus available to support the Garden's work in the country.

"Everybody wins in this situation," said Dr. Porter P. Lowry II, head of the Garden's Africa and Madagascar Department. "Madagascar's Central Bank wins because part of its hard-currency debt is paid off. ING Bank wins because at least some of the money owed to them is paid off. And the Garden wins because the money we have available for work in Madagascar will go twice as far. And our Malagasy partners win because we will be able to do that much more good work together."

The debt-swap agreement was developed and negotiated by Lowry with assistance from Lucienne Wilme, the Garden's permanent representative in Madagascar.

Curatorial Workshop Held for African Visitors

A WORKSHOP in the Garden's research methods was held for five African scientists visiting St. Louis, April 8-16, 1993. The scientists collaborate with Garden research programs in their countries, and the workshop was designed to assist them in strengthening their own facilities by providing an overview of the methods and techniques used in the Garden's herbarium.

The visitors were Dr. Alfred Oteng-Yeboah, chairman of the Botany Department, University of Ghana; Daniel Abbiw, curator of the herbarium, University of Ghana; Emile Doumbia, Ivory Coast; Solo Rapanarivo, herbarium assistant at the Parc de Tsimbazaza, Madagascar; and Dr. William Mziray, director of the National Herbarium, Tanzania. The visitors were in St. Louis to attend the DNA Bank-Net meeting held at the Garden April 5-7, 1993 (see the *Bulletin*, May/June 1993).

A wide variety of topics in herbarium administration and maintenance were covered, with presentations by various Garden staff members in their fields of expertise. The workshop and meetings also helped participants to meet colleagues from other countries and broaden their professional connections.

the plant species of tropical forests are lost, and they are rapidly disappearing, the world will lose many potential drugs that have not yet been discovered. Through its natural products program, the Garden is promoting pharmaceutical and agricultural research and stressing the importance of this work for tropical forest conservation.

Liz Claiborne / Art Ortenberg Foundation Supports Garden Research

WORKING to find long-term solutions to the challenges of conservation is a priority of the Liz Claiborne / Art Ortenberg Foundation, and its support of Garden research programs reflects that commitment. Founded by designer Liz Claiborne and her husband Art Ortenberg, the Foundation currently provides funding for Garden research in Madagascar and Ecuador and supports the graduate education in botany of Armand Randrianasolo from Madagascar.

RICHARD BENKOF

Armand Randrianasolo

Armand, a student at the University of Missouri-St. Louis, is working to complete his master's degree at the Garden. He has already been accepted for the Ph.D. program. The Claiborne / Ortenberg Foundation awarded a two-year grant to support his studies.

"Education is the key to the Garden's approach in Africa," said Dr. Porter P. Lowry II, head of the Africa and Madagascar Department. "Training local people to plan and carry out botanical research is the only way to accomplish everything that needs to be done. It also gives the residents of each country a stake in working to preserve their natural resources."

Lowry continued, "In addition, we don't just train people; we work with their institutions to help them raise funds, improve their facilities, and strengthen their programs so that the people we train will have jobs that utilize their skills. All of this pays off a thousandfold, because we establish networks of individuals who all know one another and work together."

continued on next page

CLIFF WILLIS

Shown in the Garden's herbarium (from left): Daniel Abbiw; Solo Rapanarivo; Emile Doumbia; James S. Miller, MBG; William Mziray; and Alfred Oteng-Yeboah.

CLAIBORNE continued

The Claiborne / Ortenberg Foundation has supported this approach by making a three-year grant to the Madagascar program for education. The program will train groups of Malagasy botanists in the skills needed for professional field research and plant conservation.

Training is aimed at three levels: a large number of parataxonomists, who perform basic field collecting; a smaller number of field botanists, who perform all aspects of field work, herbarium analysis, and data management; and a small group of research botanists, who will receive graduate training in the United States. "We plan to use this 'pyramid' training plan as a model in all of our programs in Africa," Lowry said.

In addition to the education program in Madagascar, the Claiborne / Ortenberg Foundation also made a three-year grant to support a botanical inventory and production of an annotated checklist of the plants of Ranomafana National Park in Madagascar. A team of botanists from the Garden, the Parc de Tsimbazaza, and students from the University of Antanarivo is collaborating with local residents and researchers from the Duke University Primate Center to survey the resources of the park.

The project is a good example of the kinds of linkages the Garden has established with other research and conservation groups in Madagascar and in every country where it is working. "We seek to extend our reach and effectiveness by collaborating in every way possible," said Lowry. "Often it is simply a matter of sharing information among people working in the field, but building linkages among organizations with common goals increases the results for everyone."

The Claiborne / Ortenberg Foundation also supports work at the Jatun Sacha Biological Station in Ecuador, directed by Garden researcher Dr. David Neill. A one-year grant in 1991 funded environmental education programs at Jatun Sacha for school children, research scholarships for Ecuadorian biologists in training at the station, and the development of a botanical garden at Jatun Sacha. A second one-year grant in 1992 continued support for the environmental education program plus a plant conservation center and agroforestry extension project at Jatun Sacha.

"We are extremely grateful to the Claiborne / Ortenberg Foundation for their support of these research programs," said Dr. Peter H. Raven, director. "We are very pleased that they share our commitment to far-reaching, long-term goals and solutions." ■

CLIFF WILLIS

Mr. and Mrs. Blanton Whitmire (center) and their family

Whitmire Wildflower Garden Is Dedicated

ON a beautiful afternoon, June 12, 1993, the new Whitmire Wildflower Garden was dedicated at Shaw Arboretum, with a celebration that included the Whitmire family, friends, and Garden staff. The new garden occupies the hillside below the historic brick Manor House and is a glorious display of colorful native foliage and flowers blooming luxuriantly along paths winding beneath tall, shady trees. (See the *Bulletin*, May/June 1993.)

"This is a wonderful gift from the Whitmires," said John Behrer, manager of the Shaw Arboretum. "We all worked hard to get it ready, and I truly enjoyed working with Blanton, Peg, and their family to bring this dream to reality. We hope that every Garden member comes out this summer to enjoy the display."

A view of the Manor House from the new Whitmire Wildflower Garden.

An historical view of the Bryan Mullanphy School on Shaw Avenue with its formal garden.

Opening in September

New Botanical Garden Magnet School

AFTER years of planning and hundreds of meetings, the Mullanphy-Botanical Garden Investigative Learning Center will open in September, 1993. The Investigative Learning center (ILC) is one of two magnet schools developed by the St. Louis Public School District in collaboration with the Missouri Botanical Garden, the Saint Louis Zoo, the University of Missouri-St. Louis, and the St. Louis Science Center.

This September, approximately 390 children from across the metropolitan area, grades K through 5, will attend classes in the Mullanphy-Botanical Garden ILC, located in the Bryan Mullanphy School building on Shaw Avenue, a short distance from the Garden's entrance. The Garden has worked with the St. Louis Public Magnet Schools Program since the mid-1970s to offer a strong adacemic program that emphasizes inquiry, investigation and analysis through courses in natural sciences. The schools also employ mathematics and computer science in a complete curriculum designed to develop students' skills at problem solving and productive thinking skills.

"The Garden and the St. Louis Public Schools have a long history of educational cooperation," said Dr. Larry DeBuhr, director of education at the Garden. "We are very pleased and proud that the opening of the Mullanphy-Botanical Garden ILC will allow us to expand this collaboration in educating the children of St. Louis. Scientific training at an early age can instill lifelong interest and enthusiasm for science, which will benefit our society far into the future."

During the coming year, a large addition to the school building will be completed, which will include three science laboratories, a math lab, a computer lab, and a foreign language lab. A greenhouse will be constructed adjacent to the science labs. Outdoor gardening space will be available for teachers and students to use for growing plants. When the addition to the building is completed in 1994, student enrollment will increase to 584.

The Garden has a long history with the Bryan Mullanphy School. In 1910 the St. Louis Board of Education purchased the land where the school stands from the Garden's Board of Trustees. A unique feature of the building when it opened in 1915 was the formal garden at the front entrance. With the help of the Missouri Botanical Garden, this formal display will be reconstructed, providing a beautiful entrance to the school and opportunities for the students to learn about plants and horticulture.

Present plans call for the Garden's magnet instructor, Alicia Ivory House, to work closely with the teachers at the botanical garden school to help them integrate the botanical science theme into the curriculum. Ms. Ivory House will serve as the Garden's liaison with the school, coordinate teacher training activities with other Education Division staff, and help the teachers at the Mullanphy-Botanical Garden ILC provide exciting and innovative science classes for the students.

Alicia Ivory House with a magnet school class in the Climatron.

Fragrance Garden

ROSES at their fragrant best are featured in this garden. Old-fashioned varieties greet the visitor at the garden's entrance and rose bushes, climbers and topiaries are seen and scented throughout the Fragrance Garden. Should the visitor seek beyond the essence of the rose, lilacs in spring and the perfume of fragrant annuals in summer will delight the nose and please the eye.

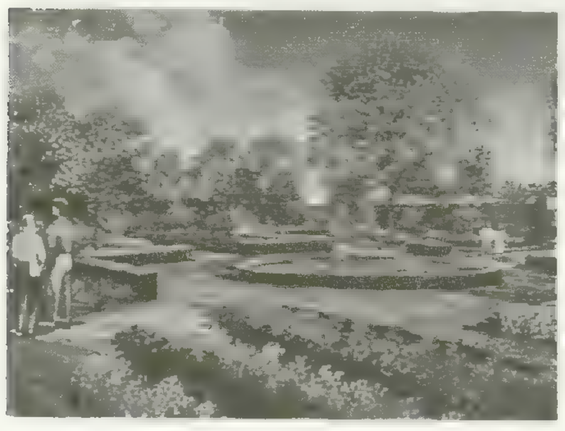
Visitors are enticed to pause under the vine-draped cedar arbor, or to take a seat on one of several old-fashioned wooden benches to indulge their senses and be soothed and cooled by the Fragrance Garden's gurgling fountain ornamented with bronze flying geese.

A love of roses, plus childhood memories of walks to Shaw's Garden from their family home in Soulard, inspired the gift of the Fragrance Garden by donors who wish to be anonymous. "As with many gifts to the Garden, the Fragrance Garden was made possible by family members joining together to create a meaningful legacy," said Ernestina Short, gift planning coordinator for the Garden.

Renderings by Marty Coulter

The Fragrance Garden is one of 23 residentially scaled demonstration gardens planned for the William T. Kemper Center for Home Gardening in the near future. In this and coming issues, we will describe the gardens, both those already sponsored and those still available for donation. Members interested in learning more about sponsorship may call the Development Office at (314) 577-5120.

Future Gardens



VEGETABLE GARDEN

What fruits and vegetables for the family table grow best in the St. Louis area? What flower varieties are best for cutting and display? This garden provides demonstration vegetable plots, a dwarf apple and peach orchard, culinary herb displays and a cordon fence for blackberries. While the emphasis is on the practical and homegrown, the aesthetic needs of the family are met by this garden's beautiful pool of waterlilies, irises, and other aquatic plants.

AGRONOMIC GARDEN

Located adjacent to the Vegetable Garden is the Agronomic Garden, where dramatic displays explain food crops from around the world, including right here in the Midwest. A lath-roofed, brick-columned shelter located in the garden's center provides shaded seating and an area for outdoor instruction where visitors can learn about crops of the world from interpretive panels.

APPLE ALLEE

This elegant display is a tree-lined promenade through the demonstration garden area. The brick-lined, exposed-aggregate walk is flanked by matching specimen apple trees. In spring, the apple blossoms overhead compete with flowering bulbs scattered among the groundcovers below. This grand allee terminates in a spectacular circular fountain where six bronze geese frolic in the fountain's spray.

DEMONSTRATION GARDENS planned for the Kemper Center for Home Gardening:

Agronomic Garden
Apple Allee
Backyard Garden
Bird Garden
Butterfly Meadow
Children's Garden
City Garden
Entry Court
Experimental Garden
Flower Borders
Fragrance Garden
Fruit Garden
Garden for All
Groundcover Borders
Lath House
Limestone Glade
Native Shade Garden
Prairie Garden
Rock Garden
Secret Garden
Shade Garden
Terrace Garden
Vegetable Garden

Home Gardening

TREES, SHADE & GROUNDCOVERS: THE TWILIGHT ZONE

WITHOUT DOUBT one of the trickest spots in the landscape is that "black hole" beneath the tree boughs. What is it about this spot that troubles the most determined, ardent backyard gardener? Why can't you simply grow grass there and forget about it? Face it, no matter what shade mix you try, grass seedlings will not tolerate low light for very long. Instead of struggling to grow a lawn under your trees, try planting perennial groundcovers instead.

Types of Shade

There are several things to consider before planting a garden under the trees. The first is the density of the shade, either deep, medium or light shade.

Deep shade means constant shade, as in the middle of a woodland area, where it is still dim at mid-day. In your backyard, this category includes the north side of walls and areas beneath evergreens and dense deciduous trees.

Medium shade, commonly referred to as dappled shade, exists where some fairly bright indirect light is available but no direct light occurs at any time, as underneath the high branches of a large tree. If you have a zoysia lawn, this is where cool season grasses come in, giving the area a speckled look in April before the zoysia has greened up. Medium shade provides just enough light to support the more colorful flowering plants.

Lightly shaded areas get peeks of direct sun for three or four hours each day, not enough to grow tomatoes, but good enough for some leafy herbs and shade-tolerant full-sun plants. The seasonal light exposure under deciduous trees might be considered lightly shaded and is a good place for spring bulbs, whose light requirements are met before the tree leafs out.

Let the Sun Shine In

If the light is still inadequate for the plants you want to grow, consider pruning to let more light in. This applies primarily to healthy deciduous trees. You must consider the branching habit of the tree and whether you can thin out branches without destroying the tree's symmetry and growth. You should be able to remove up to one-third of the tree's foliage without causing problems. This modification should be done in the dormant season, spring or fall after the leaves come off, and is recommended only if the tree has been watered during stress periods and fertilized every three to five years. Evergreens are too dense to adapt with this technique.

Modifying the Planting Site

The second thing you should consider when planting under trees is the condition of the soil, especially as it relates to the tree's root system. If you have any doubt, start with a soil test before doing anything. If pH adjustments are necessary, add lime or sulfur in recommended amounts; don't guess. Most shade plants love acid soils, since soils in shaded areas typically are wetter and wet soils classically are more acidic.

In most cases, you should not till the soil completely before planting as doing so may damage the tree's roots. To improve the soil, just lay four to six inches of compost, leaf mold or sphagnum peat over the surface as mulch, working it in lightly as you plant and letting it work itself in over time.

Deep-rooted trees like most oaks, hickory, walnut, beech, sassafras, sweetgum and black gum have deeper root systems, making planting shaded areas under these trees fairly easy. Trees with fiberous surface roots, like maple, elm and sycamore, make it harder to plant without prying up a lot of roots. For this situation choose groundcover plants that do not require deep planting, grow in shallow soil, and root rapidly at leafy nodes along the stem. The most common leafy groundcovers include English ivy, *Hedra helix*; pachysandra, *Pachysandra terminalis*; and periwinkle, *Vinca minor*.

Traffic

The last item to consider before you plant a groundcover beneath a tree is how often the bed will be raked or walked on by people and pets. Ivy and euonomyous are real plants of steel and can take some abuse. Pachysandra is more tender and can be crushed, as can periwinkle. Most other groundcovers are too delicate to plant in high traffic areas.

Perennial Groundcovers for Shade

This is the fun part! Selecting plants is a matter of determining which plants can tolerate the amount of shade you have and still do what you want. Remember, in the shade plants grow slower, taller and are generally more leafy.

Deep to Medium Shade

There are only a couple of groundcovers that will tolerate very low light. English ivies, *Hedra helix* 'Thorndale', 'Baltica', and 'Bulgaria', are hardy and popular, very durable through the winter. Planted about one foot apart, you can expect ivy to fill in within about three years under light to medium shade.

Wintercreeper, *Euonymous fortunei,* is another classical favorite. Cultivars 'Colorata' and 'Longwood' will do well here and are very versatile, growing in almost any type of soil. It may take several years, but once established it will smother out any weed. The only persistent, common problem is euonymous scale, which can be managed with dormant oil sprays in spring when the crawlers are just emerging.

Many homeowners plant Japanese spurge, *Pachysandra terminalis*, in shaded areas. Producing insignificant small, white flowers, it does well in medium to dense shade and grows about 10 inches high. This is a standard for planting under trees, known for its ability to root every six inches or so along its stem. If you want a better flower show, lesser periwinkle, *Vinca minor*, is another tough perennial for shaded areas. Cultivar 'Alba' produces white flowers, 'Atropurpurea' has purple flowers, and 'Aureomarginata' has blue flowers. Periwinkle blooms best in light shade, but otherwise does well in medium shade, reaching four to six inches in height. It should be kept fairly dry. A fungal canker disease has wiped out beds of this in our area and seems to be omnipresent. Frequent spring rains coupled with warm temperatures brings this disease out. No cultivars are known to be immune.

Hostas, sometimes called plantain lily, are very popular shade plants. There are many to choose from and often they are mislabelled. Some of the most familiar are the common green, tall-cluster hosta, *H. fortunei; H.*

undulata 'Varigata' which has a white stripe running down the center; and *H. sieboldiana,* the blue-leaf plantain lily. Hostas can be planted close together to form a very attractive ground-cover in medium to deep shade. They may not flower in dense shade, but that might be very desirable, as cutting flower stalks from a large area can be a chore. Plus, bees are very keen on the flower nectar. The varigated forms do much better if planted in lighter shade.

Never mix hostas with ivy or pachysandra; the hostas won't emerge through other groundcovers if they are thick. A better bet would be to mix hosta with daffodils or lily-turf, *Liriope muscari*, in light shade and with ferns in medium to deep shade.

Light to Medium Shade

As you work with lighter areas, the options for flower and foliage color get better. Effective, interesting, medium-sized groundcovers in light to medium shade are barrenwort, *Epimedium* sp. and hybrids; lily-turf, *Liriope muscari*; dwarf bamboo, *Sasa pygmaea*; and varigated goutweed, *Aegopodium podagraria* 'variegatum'.

Barrenwort produces clumps of heart-shaped leaves that typically die back in winter. This is a very hardy plant and one of notable interest in the English Woodland Garden, where it emerges in the spring to show its orchid-like flowers. This plant requires very little care and is known to survive where nothing else will.

The more grass-like lily-turf is a versatile plant commonly used to cover shaded areas under deciduous trees. It can be combined effectively with spring bulbs, which emerge through the dormant leaves. Lily-turf produces a small flowering spike in lightly shaded areas. Use the varigated form to add brightness to dim areas, either as a groundcover or an edging plant.

More striking in contrast for foliage color is varigated goutweed. Some people curse this plant because it is so aggressive, but in shade this trait may be welcome. Avoid overhead watering, as a fungal leaf spot disease can wipe it out in mid-sumemr.

For something different, try dwarf bamboo. It is adaptable to light shade and grows about a foot tall. This plant is hard to keep in bounds, but it does respond to mowing in the late winter or early spring for top growth control. As it spreads laterally, you can dig it out successfully, since it does not root as deep as other bamboos. However, I would not recommend dwarf bamboo for a barefoot traffic area...ouch!

If you want a little more of a flower show in light to medium shade, try spotted dead nettle *Lamium maculatum*; bugleweed, *Ajuga reptans*; creeping phlox, *Phlox stolonifera*; lily-of-the-valley, *Convallaria majalis*; or foamflower, *Tiarella cordifolia*.

Spotted dead nettle is an aggressive plant that grows very low and makes a nice groundcover in clumps. It has silvery foliage, making it a wonderful plant for contrast on the bordering edge of a shaded area. The purple mint-like flowers are small and attractive.

Bugleweed is another purple flowered groundcover that is fairly aggressive in light to medium shaded areas. It should be used to cover small to medium sized spaces and can find a good home on dry slopes. It should not be used in wet areas, being prone to root and crown rot diseases. The broad leafed cultivars are particularly nice for mixing with bulbs.

Creeping phlox, unlike its tall cousin, does very well in light shade. This plant grows only about three inches tall and advances by runners sent out in every direction. The common varieties have purple to lavendar flowers, but orange, blue and yellow flowered cultivars can be found.

Lily-of-the-valley grows well in light to medium shade in all but poorly drained soils. Its popularity as a groundcover is enhanced by the fragrant blooms produced in mid-spring. Some gardeners classify this plant as invasive but it is a problem only if you have areas where it could compete with other, less aggressive plants. Foamflower is an underutilized perennial groundcover with excellent characteristics for lightly shaded areas. It spreads by runners, with heart-shaped leaves, some winter color, and white flower clusters in early spring. It is a good competitor for soil moisture, and is hardy to -40 degrees F. Foamflower will cover an area very quickly and can be planted on two-foot centers.

Combining Shade Plants

While the perennial groundcovers may solve your immediate need to get something going in the shade areas of trees and shrubs, many plants can be selected for diversifying this special spot in the landscape. For seasonal effect, combining spring bulbs like daffodils with certain groundcovers works very well. At the Garden, the display of Spanish bluebells blooming up through the English ivy in the Mausoleum area is always a glorious sight. The bluebells die back below the ivy cover in summer.

Of course, don't forget ferns and some of the colorful annuals like impatiens, coleus, begonias and caladiums. This "black hole" beneath the boughs does not have to be a desert. ■

—Steven D. Cline, Ph.D.
Manager, Kemper Center for Home Gardening

TELEPHONE HELP

The Garden has several telephone services available to assist you.

GardenLine **577-9400**
24-hour recorded information about Garden events, hours, admission and directions.Outside area code 314, call **1-800-642-8842** toll free, 24 hours a day.

Horticultural Answer Service (314) 577-5143
Monday through Saturday, 9:00 a.m. to noon. Master Gardeners are on hand to answer your gardening questions. The Answer Service does not have Saturday hours November through February.

HortLine **(314) 776-5522**
24-hour recorded gardening information is available with a touch tone telephone. You will need a brochure listing the hundreds of HortLine topics in order to use the service; you may request a brochure by calling the Kemper Center for Home Gardening at (314) 577-9440, 10 a.m. to 4 p.m. daily. **Plants in Bloom at the Garden** is updated weekly. Press 3 when you call HortLine.

Master Composter Hotline (314) 577-9555
9 a.m. to noon, Monday through Friday. Specially trained Master Gardeners are on hand to answer your questions about yard waste management techniques. After hours leave a message and your call will be returned. The Master Composter program is supported by the Monsanto Fund.

Calendar

Kids in Bloom -- July Is Children's Month at the Garden

Enjoy a variety of events planned especially for children and their families throughout the month of July. For information on any Kids in Bloom activity, call 577-5125.

july 1—25 thursday—sunday

Edgar Denison Paintings

9 a.m. to 8 p.m. daily, Ridgway Center. An exhibit of 34 exquisite wildflower paintings by Edgar Denison, author of the field guide *Missouri Wildflowers*. See story on page 19. Free with Garden admission.

july 7 wednesday

Children's Film Festival: "The Land Before Time"

11 a.m., 1:30 and 7 p.m., Shoenberg Auditorium. Featuring a different film every Wedesday in July. Please note that an evening showing has been added this year to accomodate busy parents. Tickets for all films go on sale June 14 at the Ridgway Center ticket counter. $1 members and children; $2 non-members. Seating is limited.

july 9 friday

Folklore & Legends

10 a.m. to 4 p.m., grounds. Featuring popular storyteller Bobby Norfolk; "The Rhythms and Folklore of Africa" with Kenya Ajanaku and Jamila Afi from Young Artists of St. Louis; folksinger Kathy Shottel performing stories in music; David Williams performing his original songs about animals; and artist Steve Edwards, who illustrates his stories as he tells them. Free with Garden admission.

july 14 wednesday

Children's Film Festival: "In Search of the Castaways"

11 a.m., 1:30 and 7 p.m., Shoenberg Auditorium. See July 7 for details.

july 17 saturday

Puppets Galore

10 a.m. to 5 p.m., grounds. Back by popular demand! Festival begins at 10 a.m. with a Grand Puppet Parade, followed by performances throughout the day by Morningstar Puppet Theatre of Kansas City, Bob Kramer's Marionnettes from St. Louis, Hystopolis of Chicago, and the Dallas Puppet Theatre. Free with Garden admission.

july 17—25

saturday—sunday

Cactus Connection

Noon to 8 p.m. on July 17; 9 a.m. to 8 p.m. daily, July 18-24; 9 a.m. to 5 p.m. on July 25. Ridgway Center. The Henry Shaw Cactus Society presents its 48th annual show and plant sale, featuring a wonderful array of exotic cactuses and succulents. Free with Garden admission.

july 19 monday

Plant Clinic

10 a.m. to noon, Kemper Center for Home Gardening. Expert advice on what ails your plants. Small samples are welcome, but please seal insects in a plastic bag! Sponsored by the Garden with the Missouri Department of Conservation, University Extension, St. Louis County Soil & Water Conservation District and St. Louis County Parks. Free with Garden admission.

july 21 wednesday

Children's Film Festival: "E.T., The Extra Terrestrial"

11 a.m., 1:30 and 7 p.m., Shoenberg Auditorium. See July 7 for details.

july 22 thursday

Henry Shaw's Birthday Party

10 a.m. to 4 p.m., Tower Grove House area and grounds. Come and celebrate the 193rd birthday of Henry Shaw, the Garden's founder. Strolling musicians, magicians, jugglers, the Express Tram, and Henry Shaw himself will be on hand. Birthday cake will be served from noon to 2 p.m. in Monsanto Hall. Free with Garden admission.

july 25 sunday

Iris Society Rhizome Sale

11 a.m. to 4 p.m., Ridgway Center. The Greater St. Louis Iris Society holds its annual sale of surplus iris rhizomes from the Garden's displays, with all proceeds benefitting the Garden. Free with Garden admission.

july 28 wednesday

Grandparents' Day

9 a.m. to 8 p.m., Ridgway Center and grounds. A special day to share for grandparents and children. The Garden is free to all grandparents accompanied by their grandchildren, with free tram rides offered for all grandchildren accompanied by an adult. Enjoy a special lunch in the Gardenview Restaurant and catch the movie at the Children's Film Festival.

Children's Film Festival: "Beauty and the Beast"

11 a.m., 1:30 and 7 p.m., Shoenberg Auditorium. See July 7 for details.

august 1-31

all month long

"Celebrate the Tropics"

Special weekend activities and events during the week highlight the regions of the world where the Garden's research programis active. 9 a.m. to 8 p.m. daily in the Ridgway Center, an exhibit of photographs by Garden botanists features scenes of their work all over the world. Free with Garden admission.

august 2 monday

Plant Clinic

10 a.m. to noon, Kemper Center for Home Gardening. See July 19 for details.

august 5 thursday

Botanists on the Loose: "Amazonia" with Dr. Alwyn Gentry

7 p.m., Shoenberg Auditorium. Garden botanists present travelogues of their field trips and expeditions in tropical regions all over the world, with tales of adventure and misadventure that will bring their work to ividly to life. Free to members.

august 7 & 8

saturday & sunday

Celebrate the Tropics: "Peru and Bolivia"

11 a.m. to 5 p.m., Ridgway Center and grounds. Musicians, dancers, and food will provide visitors a glimpse of South America. Free with Garden admission.

august 11 wednesday

Botanists on the Loose: "Bolivia" with Dr. James Solomon

7 p.m., Shoenberg Auditorium. See August 5 for details.

august 14 & 15

saturday & sunday

Celebrate the Tropics: "Crafts Day"

11 a.m. to 5 p.m., Ridgway Center and grounds. Admire and purchase crafts made by our neighbors in the tropics. Regular Garden admission.

august 16 monday

Plant Clinic

10 a.m. to noon, Kemper Center for Home Gardening. See July 19 for details.

august 19 thursday

Botanists on the Loose: "Paraguay" with David Brunner

7 p.m., Shoenberg Auditorium. See August 5 for details.

august 21 & 22

saturday & sunday

Celebrate the Tropics: "The Caribbean"

11 a.m. and 2 p.m., Shoenberg Auditorium. If you're thinking of visiting the Caribbean, be sure not to miss travelogues that give you a preview of what to expect, attractions to see, and other tips to make your trip a memorable one. Free with Garden admission.

august 25 wednesday

Botanists on the Loose: "The Caribbean" with Dr. Charlotte Taylor

7 p.m., Shoenberg Auditorium. See August 5 for details.

Members' Days

july 21 wednesday *"Herbarium Tour"*

9 a.m. to noon, John S. Lehmann Building. Get a look behind the scenes of the Garden's world famous herbarium, with a special tour just for members. See how the collection of over four million plant specimens from all over the world are dried, mounted, and stored for future reference and study. Please call (314) 577-9500 to schedule your tour. Free, for members only.

august 2 monday

Special Members' Event: "Moonlight Stroll"

9 to 11 p.m., grounds. Back by popular demand! Bring a flashlight to guide your way and enjoy the Garden by the light of a full summer moon. Cash bar. Free, for members only.

august 5 thursday *"Herb Day"*

10 a.m. to 3 p.m., Tower Grove House Herb Garden. Members of the St. Louis Herb Society give informative guided tours through the Herb Garden. A variety of books and herbal products made locally by Herb Society members will be available for purchase. Lunch will be served in Tower Grove House Tea Room for $9.50 per person; call 577-5150 for reservations by July 30. For members only.

august 28 & 29

saturday & sunday

Celebrate the Tropics: "Turn Up the Heat"

Noon and 2 p.m., Kemper Center for Home Gardening. If you have a taste for the spicy foods of the tropics, be sure to attend these cooking demonstrations. Tropical foods, recipes, and samplings will be the menu for the day. Seating is limited; tickets are required and may be obtained at the Kemper Center the day of the demonstration. Free with Garden admission.

august 30 monday

Plant Clinic

10 a.m. to noon, Kemper Center for Home Gardening. See July 19 for details.

wednesdays & saturdays

Garden Walkers' Breakfast

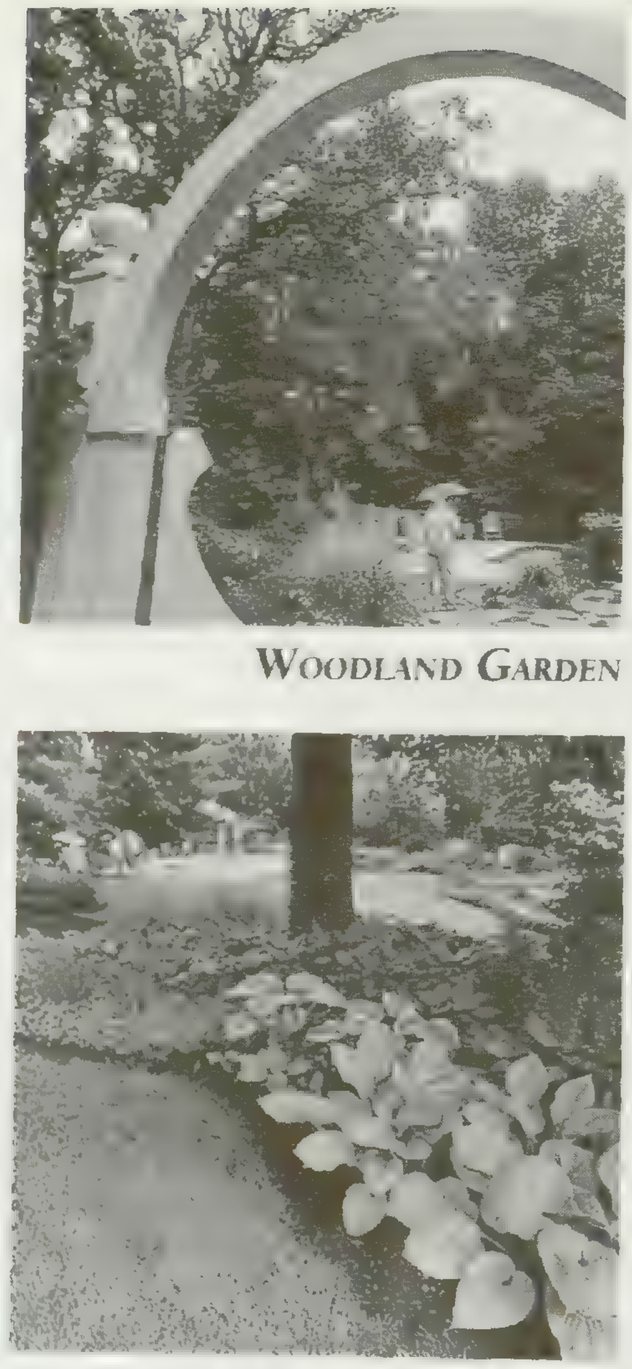
7 a.m., grounds. In cooperation with the American Heart Association, the outdoor grounds open early every Wednesday and Saturday morning to encourage fitness walking. A heart-healthy breakfast is available for purchase in the Gardenview Restaurant 7 to 10:30 a.m. Admission is free Wednesdays and Saturdays until noon.

New! Free Walking Tours Every Day

1 p.m. daily throughout the spring and summer, rain or shine. Meet the Garden Guides at the Ridgway Center ticket counter for a fascinating tour of the Garden grounds. Guides are knowledgeable about all aspects of the Garden, including the architecture, history, horticulture, natural sciences, sculpture and trees. Free with Garden admission.

Members

WOODLAND GARDEN



NATURESCAPE GARDEN

TERRACE GARDEN

EXOTIC GARDEN

FORMAL GARDEN

CITY GARDEN

JAPANESE GARDEN

PERENNIAL GARDEN

ENGLISH GARDEN

1993 Garden Tour

Singing in the Rain

NOT EVEN A TORRENTIAL DOWNPOUR could dampen the spirits of the 1,500 members who cheerfully braved the elements to enjoy the Garden's tour of nine of the loveliest private gardens in St. Louis. This was the fourth St. Louis Garden Tour; the event was first held in 1986.

The Grand Finale Party was held that evening at the home of Mr. and Mrs. Ronald K. Greenberg.

The tour and party were made possible by the hard work of Ann Bowen and Bill Gilbert, who headed the committee, and committee members Ted Atwood and Sue Oertli. Our thanks go to all who participated, with very special thanks to Ahner Florist and Greenhouses, Hartke Nursery, Maxwell Homestead Greenhouse, Top Care Nursery, Baxter Gardens, Gilberg Perennial Farms, and Gerber Landscape.

At right: Garden Tour Committee chairs Ann Bowen (left) with Bill Gilbert and Mary Longrais, president of the Members' Board.

1993 MEMBERS' TRAVEL PROGRAM

Exploring the Sea of Cortez and Baja, California

NOVEMBER 12 to 26, 1993

HAVE you ever walked through a desert in bloom? Or visited the island breeding ground of a thousand elephant seals? Or been surrounded by a towering forest of 200 year old cardon cactuses?

These are some of the adventures waiting for you on the Garden's voyage to the thin, rugged peninsula stretching 700 miles south of California along the Pacific coast of Mexico. Lying between the peninsula and the mainland is the fabled Sea of Cortez, with its 53 mostly uninhabited islands that are havens for species of plants and animals found nowhere else in the world.

The tour will explore these waters in the luxurious Yorktown Clipper, a 138-passenger cruise ship with a shallow draft and great maneuverability that allows exploration into areas that larger ships could never attempt. The expedition will be led by a staff of naturalists who will enhance your understanding and appreciation of the wonders you will see. Frequent trips ashore are made possible by a small fleet of Zodiacs, motorized rubber landing craft that can be launched to explore remote beaches and secluded islands.

For more information on our special voyage to this unspoiled part of the world, please call Brenda Banjak at (314) 577-9517.

COMING IN OCTOBER

Second Annual "Best of Missouri" Market Sunday, October 3, 1993

It's back, bigger and better than ever! Join us for an all day celebration of the best of Missouri food, specialty products, plants, music, displays, children's activities, and more! Watch for further details.

Plus—The Historic Shaw Art Fair, October 2 & 3

50 artists exhibit along Flora Place, 10 a.m. to 4 p.m. both days

"Give Change To Make a Change"

NOW visitors to the Brookings Interpretive Center can take immediate action to help preserve the world's rain forests, just by putting coins into a colorful new Conservation Parking Meter. The meter was installed recently as part of the innovative Ecosystem Survival Plan sponsored by the American Association of Zoo Keepers (AAZK) in conjunction with the Nature Conservancy to support habitat conservation programs worldwide. They estimate that each 25 cents deposited saves 90 square feet of rain forest. Funds from the parking meter at the Garden will help to support the Amboro National Park in Bolivia, where the Garden is participating in an inventory of plant diversity.

Above: Rachael Davis deposits a coin to make a colorful jaguar pop up as a tropical hummingbird flies across the display.

Invasion from Mars?

No, it's just the Garden's largest visitor being lowered into place on the roof of the Lehmann Building on Friday, June 11. Until recently the 28-foot fiberglass and iron praying mantis sculpture was a familiar landmark atop the Architectural Sculpture building on Lafayette Avenue near Highway 44. The giant insect is on loan to the Garden by its owner and creator, sculptor Bob Cassilly.

The praying mantis is named for the way it clutches its prey. They are beneficial insects that help to control the populations of other insects, specifically grasshoppers and caterpillars.

Horticulturist John MacDougal said, "Although we don't use them in our greenhouses as part of our intergrated pest management system, the praying mantis is an appropriate symbol of the Garden's leadership in using and promoting environmentally sound practices."

New Smoking Policy The Garden has implemented a new policy prohibiting smoking in all Garden buildings, including the Gardenview Restaurant. Visitors are asked to refrain from smoking outdoors on Garden grounds as well.

Standing, from left: Eileen Hahn, Jaclyn Meyer, Eve Holobeck, Frank Arnoldy, Lib Walbaum, Peter Raven, Mary Jean Poetz, Rosemary Connell C.S.J., Billie Beyer, Reinette Diller, Betty Nellums, Betty Licklider. Seated, from left: Doris Schulte, Sally Davidson, Mim Kittner, Lydia Elschlager, Mary Gamble, Louis Kittlaus, Erna Doelling, Ruth Briegel.

Volunteers Are Recognized for Service

TODAY the Garden enjoys the assistance of more than 900 people who volunteer their time and energy to provide vital services in every department. At a luncheon held on April 20, 1993, the Garden and its director, Dr. Peter H. Raven, honored the individuals who were celebrating milestones of service, having worked at the Garden as volunteers for ten, twenty, or more years.

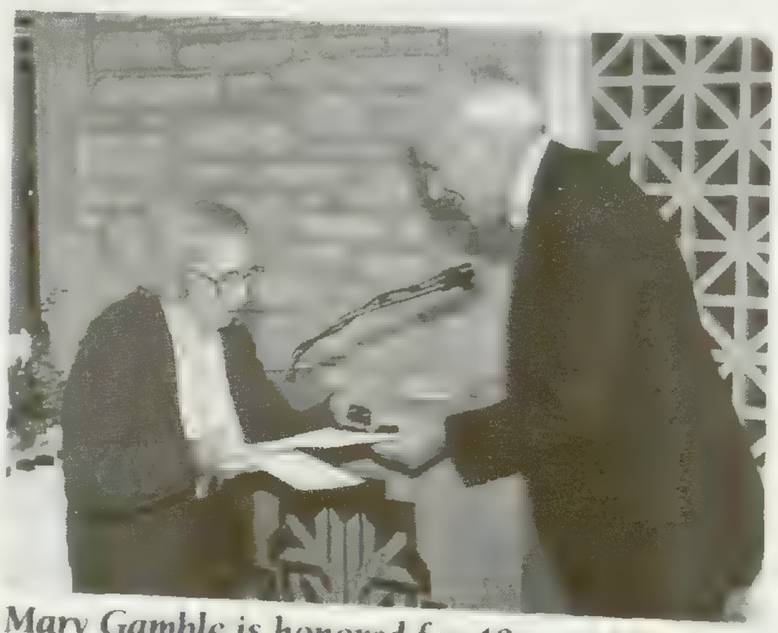
Dr. Raven said, "Each of you is crucial to our work here. You enable us through all the work that you do, but you also enable us by the message that you take out into the St. Louis area about the importance of our work. The amazing thing is that through our growth we all continue to affect and support one another and this is tremendously gratifying for me to see. We are, each of us, a little cog in the wheel that makes the Garden run."

Mary Gamble was honored for her forty years of association with the Garden. Mrs. Gamble has worked enthusiastically with the Herb Society and the Boxwood Society, not only as a gardener and teacher but as the writer and editor of books, cookbooks, journals, and articles for the Garden's *Bulletin*. Referring to the Japanese practice of designating individuals as "national treasures," Dr. Raven called for the same honor for Mary Gamble.

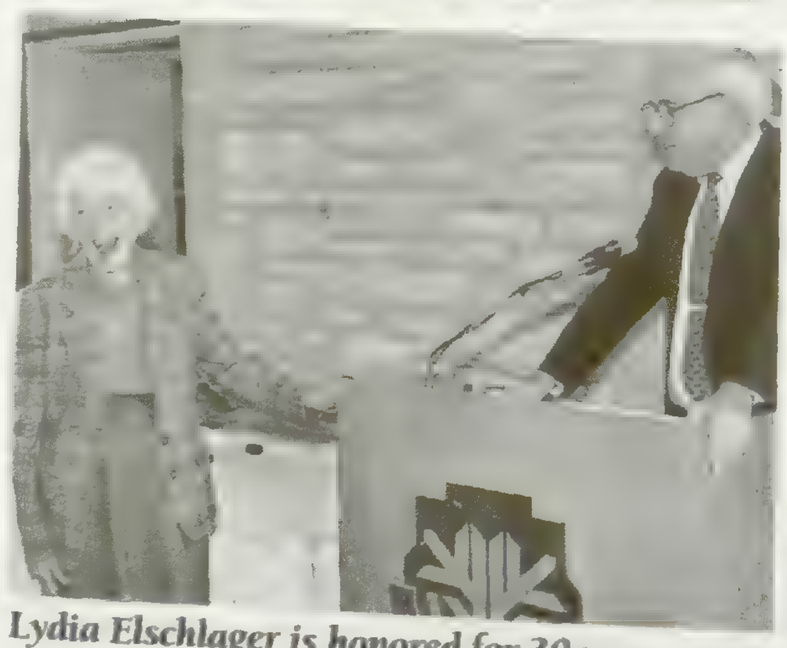
Lydia Elschlager was recognized for thirty years as a volunteer guide and interpreter at Tower Grove House, a job that comes naturally to her after her 44 years as a teacher in the Kirkwood School District.

Honored for twenty years of service were: Sally Davidson, Garden Guides; Erna Doelling, Library; Louis Kittlaus, Horticultural Answer Service; Mim Kittner, Membership Services Desk and past president of the Members' Board, who completed 20 years in April 1992; Betty Nellums, Arboretum guide; Kaye Quentin, Horticulture; Doris Schulte, Garden Guides; and Midge Tooker, Garden Guides.

Honored for ten years of service were: Frank Arnoldy, Cecelia Beyer, Dorothy Blumenthal, Ruth Briegel, Ruth Buerke, Rosemary Connell, Rienette Diller, Eileen Hahn, Eve Holobeck, Fran Kroeger, Betty Licklider, Eleanora Markus, Jaclyn Meyer, Sara Moore, Bettie Perry, Mary Jean Poetz, Mary Lynn Ricketts, Judith Smith, Lib Walbaum, and Mary Lou Widicus. John W. Scott, who completed ten years in April 1992, also was honored at the luncheon.



Mary Gamble is honored for 40 years' service.



Lydia Elschlager is honored for 30 years.

Volunteers Needed to Prepare Interpretive Signs

The Garden Gate Shop is looking for volunteers to create interpretive signs describing the scientific and environmental significance of merchandise for sale in the Shop. Candidates with experience in research and interpretive writing are encouraged to apply. This will be a challenging task, with hundreds of items that need to be described in terms of the Garden's mission. Please call Jeanne McGilligan at (314) 577-5187 for more information.

Botanical Garden Subdistrict Elects Officers

The Botanical Garden Subdistrict of the Metropolitan Zoological Park and Museum District elected new officers at its annual meeting May 19, 1993. Elected were: Pamela Shephard, chairman; Robert Orchard, vice chairman; Dr. Roy Jerome Williams, treasurer; and Betty Farrell, secretary.

Stupp Foundation Renews Support for Center

THE Norman J. Stupp Foundation recently announced renewal of its annual support of the Stupp Teacher Resource Center at the Garden with a grant of $15,000 per year for the next three years. In addition, with the aid of a special $10,000 gift from the Foundation, the Center has been able to add computer capabilities that greatly expand its services.

Since 1982, annual support from the Norman J. Stupp Foundation has helped to fund the center as part of the Garden's Education Division. The Center maintains a library of books, slide sets, videos, botanical models, games, recordings and modular programs for environmental education, all of which assist science teachers and their students.

Three years ago, a special gift by the Stupp Foundation enabled the Center to purchase its first personal computer. The more recent gift will allow for adding online access to a network of databases with the most current information on a huge array of topics: bioscience, agriculture, environmental science, and more. The Center also was able to add a workstation with access to an online public access catalogue, OPAC, to replace its card catalogue and link it to the online catalogue in the library of the Saint Louis Zoo. Soon the Center will be able to link its computer terminal with the catalogue of the St. Louis Public Library and communicate with other libraries around the world using Internet, creating a true "library without walls."

The OPAC workstation also includes a CD-ROM player, which utilizes reference works stored on digital disks. These will be especially useful to the many students who use the Center as a source of inspiration and research for their science fair projects each year.

"Teacher training is a primary goal of the Garden's Education Division," said Dr. Larry DeBuhr, director of education. "The teacher resource center contributes to that effort by placing an outstanding collection of reference materials on science in one place, helping teachers to enrich their own knowledge and skills and to pass that knowledge on to their students. We are extremely grateful to the Norman J. Stupp Foundation for helping to make these services possible."

The Center is open in the afternoons, early evenings and Saturday mornings -- times convenient for busy teachers. Anyone is welcome to use the Center, but only teachers and Garden personnel may borrow materials. For more information, please call coordinator Pamela Pirio at (314) 577-9501.

Grant Supports Teacher Training

THE Elberth R. and Gladys Flora Grant Charitable Trust has awarded $10,000 to the Missouri Botanical Garden for the development of educational materials. This generous gift will allow the Education Division to complete two projects that will benefit hundreds of teachers and students for years to come.

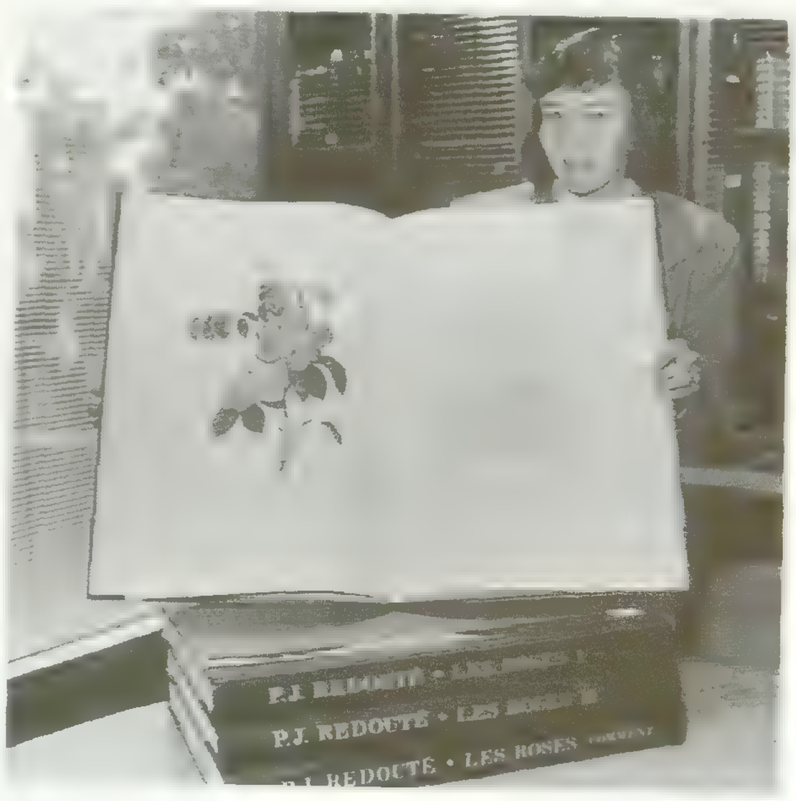
The first project is the development of a comprehensive set of materials that teachers will use in the classroom in conjunction with field trips to the Garden. These lessons will be printed as individual units for distribution to teachers when they schedule a visit. Teachers will be able to use the lessons before and after field trips, making the visit more integral to the school classroom experience. "In this manner, the educational value of field trips to the Garden is greatly enhanced," said Dr. Larry DeBuhr, director of education. "Students coming to the Garden to learn about plants and the environment will be better prepared for the experience and will learn more as a result."

The second project is the production of a field trip guide to the Garden for teachers who bring classes to the Garden, but have not scheduled a class or tour with Garden staff or volunteers. Each year the Garden is able to provide classes or tours to only about half of the teachers who call and request programs. Many teachers visit the Garden on their own. This field trip guide will provide teachers with specific lesson plans for activities they can do at the Garden during times when tour guides or instructors cannot be provided. The guide will be distributed to school libraries and will be available for sale.

Medicinal Plants of China

THE Garden library has acquired a magnificent new publication, a comprehensive modern treatment of the plants used for medicinal purposes in China. The basic 8-volume set published to date treats 1,600 species, each precisely illustrated in color and fully described, including its Latin, Chinese and Japanese names, chemical properties, medicinal uses, geographical distribution, methods of preparation, and more. The complete 25-volume set will describe 5,000 medicinal plants, animals, minerals, insects, fungi, and more. The work is a joint publication of the Public Health Department of the People's Republic of China and Yukonsha Inc. of Japan. Written in Japanese, the project enlisted the participation of 4,600 people, including editors, scholars, researchers, translators, and illustrators.

Support for the purchase of the *Medicinal Plants of China* was provided in 1992 by a gift from the Episcopal Diocese of Missouri in honor of the retiring bishop, the Rt. Rev. William A. Jones, Jr. "This is a tremendous acquisition for our library," said Dr. Peter H. Raven, director. "We are absolutely delighted to be able to add it to our collection."



IN MEMORY OF JOHN K. WALLACE, SR. -- To commemorate the longstanding involvement of the late John K. Wallace, Sr. at the Missouri Botanical Garden, family and friends have dedicated in his memory three folio volumes of Les Roses by Pierre Joseph Redoute. These volumes are an exact reprint of the original edition published between 1817 and 1824, renowned both for its beauty as a work of art and its scientific precision. The Garden's set, which includes a fourth volume of commentaries, is one of a limited edition of 500 produced in Belgium and purchased in the early 1970s. It is housed in the rare book room of the Garden's library and displayed here by Linda Oestry, reference librarian.

CLIFF WILLIS

Tarciso Filgueiras

AN important aspect of the Missouri Botanical Garden's work is its dedication strengthening botanical institutions in other countries and training botanists.

Dr. Tarciso Filgueiras, a botanist from Brazil, is a prime example of the beneficial interchange the Garden fosters with botanists around the world. Filgueiras is on leave from his work at the Brazilian Institute of Geography and Statistics for a one-year post-doctoral stay at the Garden. Filgueiras arrived in St. Louis in September 1992 and will remain, with occasional field trips back to Brazil, until 1993. His post-doctoral year was funded through a grant from CAPES, the Brazilian post-graduate agency.

Filgueiras is a specialist in grasses. His project during this post-doctoral year is to prepare a checklist for the grasses of Central Brazil. He has been working closely with the Garden's grass expert, Gerrit Davidse.

Filgueiras is extremely enthusiastic about this project. "While working on this checklist, I've discovered three new species and a new genus," he says with excitement. "Because of their usefulness to society, grasses are generally very well known. It is very unusual to find a new genus."

The new genus and species were discovered relatively close to one another, near a nickel mine in Central Brazil. These discoveries have led Filgueiras to pursue an additional course of study: serpentine ecology. Serpentine soils have a very high content in certain minerals, especially nickel, chromium, and cobalt. Only highly specialized plants have adapted to survive in this type of soil. As a result, these plants are usually endemic, that is they are found nowhere else. "Unfortunately, these areas are frequently exploited for mining and are therefore threatened," he says.

Filgueiras wants to collect the plants of the serpentine area in Central Brazil before they are destroyed in order to convince people to preserve these areas. "I need to gather the data," he says. "I hope to do the field work for at least 18 months, then come back to the Garden to analyze the plants so that I can present a strong case for protecting the area." Filgueiras won't limit himself to grasses when collecting in the serpentine soils. "All the plants are important and threatened, so I will do general collecting."

His time at the Garden has allowed him to explore these new opportunities. "It is a privilege to work here," he says. "The herbarium and the library are extremely important resources. But it is the human resources that are especially valuable. Everyone is very cooperative and open to discussion -- they are just wonderful. I will always value my year at the Missouri Botanical Garden and I look forward to ample future cooperation."

CLIFF WILLIS

Dmitry Geltman in the Garden herbarium

Visitors from Russia

Dmitry Geltman, a botanist from the Komarov Botanical Institute in St. Petersburg, Russia, visited the Garden for two months recently to work in the herbarium. Dr. Geltman is a senior scientist and has been an assistant keeper of the herbarium at the Komarov Institute since 1979, in charge of the Far East and Siberian sections.

This is Geltman's second visit to the Garden; he was here in 1991, when he worked with the Garden's TROPICOS database system. Back in St. Petersburg he trained a team of botanists in using TROPICOS, and they have prepared a checklist of the plants of the former U.S.S.R. that will be published by Cambridge University Press.

Also visiting the Garden this spring was Vyacheslav Barkalov, from the staff of the Institute of Biology and Petology, Far Eastern Branch, of the Russian Academy of Sciences in Vladivostok, Russia. Barkalov was here to study TROPICOS, and to consult on the *Flora of China* project.

CLIFF WILLIS

***VISITOR FROM BEIJING**--The Garden hosted a dinner on May 17, 1993, in honor of Professor Hu Qiheng, vice president of the Chinese Academy of Sciences in Beijing, China. Prof. Hu discussed projects of mutual concern with Garden botanists, including the Flora of China project which is headquartered at the Missouri Botanical Garden. From left: Dr. Peter H. Raven, Prof. Hu, and Dr. William Tai, director of the Flora of China project for the Garden.*

"Lost" Orchid Illustrations Published

THE Missouri Botanical Garden, jointly with the Royal Botanic Gardens, Kew, has just published *Thesaurus Woolwardiae*, a beautiful new series of reproductions of 19th-century watercolor paintings of orchids. These paintings, by legendary orchid author and illustrator Florence Woolward, have never before been seen by the public. They were discovered recently in a castle in Scotland.

Sixty of Florence Woolward's superbly executed paintings are reproduced in their original full colors. The series is published in elephant-folio format (11 3/4 by 16 1/2 inches) and divided into four volumes of 15 plates, each volume containing one plate of double size on a fold-out page.

The name Florence Woolward is legendary in the world of orchids. She was both author and illustrator of the last of the grand tomes in elephant-folio format of the 19th century. Her works were renowned for beautifully hand-colored lithographs of orchids, subjects of a craze that had swept the aristocracy of Europe. Among the late 19th-century connoisseurs of orchids was the Marquis of Lothian, whose collection of cultivated orchids at Newbattle Abbey near Edinburgh, Scotland, begun about 1876, became one of the finest and most complete in existence at that time. Beginning in 1879, he commissioned Florence Woolward to paint portraits of his specimens as they came into flower.

One hundred years after they were painted. Lord Ancram, the heir to the present Marquis of Lothian, discovered this large collection of Woolward's paintings. He recognized them as an historical treasure and arranged for them to be published by the Missouri Botanical Garden in association with the Royal Botanic Gardens at Kew.

Each illustration is accompanied by a botanical description of the orchid illustrated. The descriptions are up-to-date and represent current scientific thinking. Volume One is devoted to the slipper orchids, including ladyslippers, a group found worldwide that has a distinctive inflated lip modified into an insect-trapping pouch. Phillip J. Cribb, curator of the Orchid Herbarium and assistant keeper of the Herbarium at Kew, is the author. Volume Two, written by Jeffrey Wood, assistant curator of the Orchid Herbarium at Kew, illustrates the large and showy Old World genus *Dendrobium*, popular for cultivation and used in hybrids. The third volume treats the New World genus *Oncidium* and its allies, including *Odontoglossum*, *Miltonia* and *Brassia*. This is another group popular among growers for its large blossoms. Mark W. Chase, head of Molecular Systematics at Kew, wrote the text. The final volume, by Joyce Stewart, Sainsbury Orchid Fellow at Kew, depicts miscellaneous genera, including *Cattleya*, often used in corsages, *Laelia*, and *Orchis*. The foreword is written by Carlyle A. Luer, research associate of the Missouri Botanical Garden, who also collaborated on the project.

The volumes are lightly bound with stiff paper covers. Each contains 15 plates, available from the Missouri Botanical Garden for $50 per volume or $175 for the set of four. To order call (314)577-9534.

CLIFF WILLIS

***EDGAR DENISON WILDFLOWERS** — Edgar Denison, the dean of Missouri naturalists, and Mr. and Mrs. Blanton J. Whitmire have collaborated to present 34 of Mr. Denison's exquisite paintings of wildflowers to the Garden, where they are on exhibit during July. Mr. Denison is a distinguished photographer, lecturer, and author noted for his splendid field guide,* **Missouri Wildflowers.** *Shown at left with one of the framed paintings are (from left) Blanton and Peg Whitmire, Edgar Denison, and Peter Raven.*

Marilyn LeDoux Is Certified as a Judge of the American Orchid Society

AT the March 18, 1993, meeting of the Trustees and the Committee on Awards of the American Orchid Society in San Antonio, Texas, Marilyn LeDoux of the Garden's Horticulture Division was elevated to Certified Judge of the American Orchid Society. Marilyn had been training to become a certified judge for three years. She will judge orchid shows here at the Garden and throughout the midwest, and will continue her training to become an Accredited Judge.

Robert F. Nagel, training coordinator for the Mid-America Regional Judging Committee, said, "Marilyn has proven herself to be an exceptionally knowledgeable judge candidate as well as an exceptional grower. Her reputation is well known throughout the fifteen state Mid-America region, not only for her growing ability but, with the help of her husband Brian, for staging outstanding exhibits for the Garden. Two Gold Certificates in two years is a record hardly equalled anywhere in the country."

Orchid Show Winners

Brian and Marilyn LeDoux took top honors for the Garden at the Mid-America Orchid Show held April 16–18 in Peoria, Illinois. Their 60-square-foot exhibit earned 30 awards and ribbons, including the American Orchid Society Show Trophy, awards from *The Orchid Digest* for Outstanding Exhibit and Outstanding Plant, and 26 awards for individual plants, including eight first place ribbons. The Garden was the only botanical garden represented among 38 entrants in the show. Special thanks go to the Orchid Society of Greater St. Louis for supporting the cost of the trip. For more on Brian and Marilyn LeDoux and their work at the Garden, see the *Bulletin*, January/February 1993.

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19th Annual

Japanese Festival

Labor Day Weekend
September 4, 5 & 6, 1993
"Flowers, Trees and Water"

Sponsored in conjunction with a coalition of organizations including the Japan America Society of St. Louis, the Japanese Chamber of Commerce and Industry of St. Louis, The St. Louis Japan Society, the St. Louis Japanese Language School, the Japanese-American Citizens' League, the St. Louis-Suwa Sister City Committee, and the Women's Association of the Japan America Society.

This year the festival celebrates the Japanese people's very special appreciation of nature. Highlights include:

Opening Parade of Nagamochi and Omikoshi Shrines

Martial Arts Demonstrations and Sumo Wrestling Display

Candlelight Walks in the Japanese Garden

Cooking Demonstrations

Karaoke Contests

Ikebana and Bonsai Displays

Displays of Japanese fish, *koi* and *kingyo*; and Japanese crests, *kamon*

Talk Show: Living in Japan

Calligraphy Exhibit

Koto Music

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And more! Plus --

The San Francisco Taiko Dojo drummers, with an evening performance under the stars that is not to be missed!

Call GardenLine, 577-9400, for up to the minute information 24-hours a day, beginning August 1. Outside St. Louis call toll free, 1-800-642-8842.

SPECIAL WEEKEND EVENT

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B U L L E T I

Missouri Botanical Garden

SEPTEMBER/
OCTOBER
1993

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Comment

MISSOURI BOTANICAL GARDEN MISSION: "TO DISCOVER AND SHARE KNOWLEDGE ABOUT PLANTS AND THEIR ENVIRONMENT, IN ORDER TO PRESERVE AND ENRICH LIFE."

THE ST. LOUIS AREA is only just beginning to recover from the devastating floods that swept through our region this past summer. Despite the terrible losses suffered by so many in our community, we can all be heartened by the courage, selflessness, and teamwork displayed by so many in the face of a great natural disaster. Like every institution in the community, the Garden responded to the call for help from our neighbors with all the personnel and resources we could muster, and we will continue our support. (Please see the story below.)

On a happier note, September and October usher in a season of exciting celebrations at the Garden. The 19th annual Japanese Festival is a highlight of the Labor Day Weekend, and on September 18 we inaugurate the long-awaited Mullanphy Botanical Garden elementary magnet school. It seems especially appropriate this year to honor the farmers and agricultural workers of the Midwest, and we are doing just that in October with the "Best of Missouri" Market and the opening of an exciting new agriculture exhibit developed by the University of Missouri.

On page 9, we pay tribute to some of our very special friends, our volunteers, who were honored at Volunteer Evening. The extraordinary efforts of these men and women make the Garden what it is today, and we are deeply grateful to each of the more than 800 people who give so selflessly of their time and talent. This is especially true of Robert E. Kresko, a member and former president of the Board of Trustees, who was awarded the Henry Shaw Medal in honor of his invaluable contributions to the Garden over the past several years (see page 5).

— Peter H. Raven, Director

Garden Aids Flood Relief

LIKE ALL OF THE INSTITUTIONS in the St. Louis community, the Garden responded immediately to the devastation caused by the flooding of the Mississippi and Missouri Rivers this summer. Staff have used Garden vans and paid work time to drive on behalf of Operation Food Search and other community service organizations. Staff members continue to contribute food, clothing, and personal items, and have already given over $1,000. All coins collected from fountains at the Garden are being donated. In addition, Dr. Raven has announced that the Garden will match retroactively, dollar for dollar, all money donated by staff to flood relief, and will continue to match contributions to the end of 1994. And the Members' Board has pledged $1 of every admission sold to the "Best of Missouri" Market on October 3 to flood relief, a contribution that is expected to total $10,000 to $15,000.

The Garden's Flood Relief Committee continues to coordinate assistance with Operation Food Search. Once urgent personal needs of flood victims are met, the Garden will select a specific site to assist with cleanup efforts.

IN MEMORY OF EDGAR DENISON — As this issue of the Bulletin went to press, we were saddened to learn of the death of Edgar Denison on Saturday, August 14. A memorial service for Mr. Denison will be held at the Manor House, Shaw Arboretum, at 11 a.m. on Saturday, September 11, 1993. We extend our deepest sympathy to Mr. Denison's family and friends. A tribute to Mr. Denison will appear in the November/December issue of the Bulletin. —Editor

Moving?
Please remember to send us your new address.

To avoid missing any of your membership mailings, we need notification of your new address at least three weeks before you move. Please enclose the mailing label on the back cover of this *Bulletin* and mail to:

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On the Cover

Water lilies bloom in the Linnean House pools.

Photo by King Schoenfeld

Editor

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1993 Missouri Botanical Garden

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OCT 5 1993
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IN MEMORIAM

Alwyn H. Gentry; Ph.D.

1945 — 1993

On August 3, 1993, the Garden and the international scientific community suffered a tragic loss with the death of senior Garden curator Alwyn H. Gentry in a plane crash near Guayaquil, Ecuador. Gentry, the world's leading expert on the plants of Latin America, was participating in an aerial survey 350 miles southwest of Quito when the crash occurred. Three other people, including the distinguished American ornithologist Ted Parker, were also killed in the crash. Three biologists survived the crash.

The scientific group was conducting a reconnaissance trip for Conservation International's Rapid Assessment Program (RAP). Gentry spent his career exploring and studying the tropical forests of Latin America and was without doubt the most knowledgeable person in the world about the complex flora of the region.

By his own account, Gentry fell in love with the tropics in the summer of 1967, during a course offered by the Organization of Tropical Studies (OTS) in Costa Rica. He earned his Ph.D. in botany at Washington University in 1972, specializing in the Bignoniaceae (catalpa) family. His graduate work was so impressive that Peter Raven hired him upon graduation, and Gentry spent his entire career on the staff of the Garden.

Dr. Walter Lewis, professor of biology at Washington University and Gentry's doctoral advisor, said, "Al had a genius for observing plants. For example, he rarely forgot a plant he had seen just once, as if cemented into his memory instantaneously. We shall miss Al's talent, for it was profound and intense, and totally dedicated to increasing our understanding of plants worldwide."

Gentry's extraordinary ability to recognize plants made him one of the world's leading field biologists. He made more than 70,000 botanical collections in his lifetime and recently produced a landmark book, *A Field Guide to the Families and Genera of Woody Plants of Northwest South America*, published by Conservation International. This work is of lasting significance because it aids in the identification of plants without relying on flowers and fruits. Gentry used sterile vegetative characters such as leaves, bark and odor to identify plants in the most biologically diverse regions on Earth.

Another of Gentry's lasting contributions was his meticulous inventory of six one-hectare plots established by the Smithsonian Institution in Tambopata Reserve in southeastern Peru. Within these permanent plots, each including a distinct type of forest habitat, Gentry identified and tagged every tree and liana, over 600 species. This type of baseline data is essential to in-depth biological studies and usually requires teams of botanists working for several years.

Gentry extended his survey technique by inventorying a number of one-tenth hectare plots all over the world, using the data to predict the diversity a region should have, based on such factors as rainfall, altitude, seasonality, and soil conditions. This technique formed the basis of his work for Conservation International's RAP teams, which Gentry and Parker co-founded four years ago to inventory quickly the biodiversity of poorly known areas in the tropics. The results of their assessments were made available to the countries in question to help formulate practical conservation programs.

In 1990 The Society for Conservation Biology awarded Gentry its Distinguished Achievement Award. In 1991 he was one of ten "environmental problem solvers" to receive a prestigious grant from the Pew Scholars Program in Conservation and the Environment, which he used to further his work in tropical forest conservation.

Professor Ghillean T. Prance, director of the Royal Botanic Gardens, Kew, said, "It is hard to think of Neotropical botany without Al Gentry, so great has been his contribution over the last 20 years. At least, during his short life, he worked so hard and enthusiastically that he achieved much more than most people do during a normal lifespan. It is also fortunate that he did not just collect field data but put much of it into a really important string of publications and books.... I have been in the field with Al and seen his enthusiasm and his skills with such things as extension poles to reach high into the trees. I also deeply appreciate his long association with Flora Neotropica, which he served as secretary for many years. His own enthusiasm certainly also drummed up a lot of support for the Flora Neotropica project. Al will be sorely missed by all his colleagues."

Dr. Peter H. Raven said, "Al Gentry was absolutely relentless in his work; he would never have been happy doing anything else. His work will endure and serve as an inspiration to each of us to make the most of our own opportunities to do the very best we can. We feel his loss profoundly and extend our deepest sympathy to his family."

Alwyn Gentry's work lives on through his extensive work with graduate students. In 1991 he said in an interview with a Suburban Journals reporter, "If I've learned this much I feel I should share it. Training students also provides immortality for me, especially in the Third World. If they come to know and care, maybe they can do some good."

Gentry is survived by his wife, Rosa Ortiz de Gentry, a botanist at the Garden; a son, Darrell Gentry; two daughters, Diane and Maria Liana Gentry; his mother, Goldie Gentry; and two sisters, Sharon McCaslin and Linda El-Dash. A memorial service was held at the Missouri Botanical Garden on August 20, 1993.

YOU & THE ENVIRONMENT

Missouri Botanical Garden Environmental Policy Statement

The mission of the Garden is to discover and share knowledge about plants and their environment, in order to preserve and enrich life. Accomplishing this mission depends on the responsible management and conservation of the world's biodiversity. The quality of human existence depends on an environment that is healthful in all respects. For these reasons, the Garden places major emphasis on educating individuals to take responsibility for the overall quality of the environment. In addition, the Garden promotes public understanding of environmental issues locally, nationally, and internationally.

Particular goals of the Garden's programs are the conservation of biodiversity, sound horticultural practices, international understanding and action, and the responsible use of all resources. The Garden emphasizes these goals in its own activities and encourages individuals and other organizations to do so as well.

With this issue of the Bulletin, we introduce a new feature, "You and the Environment." These days it seems that, to paraphrase Charles Dudley Warner, "Everyone talks about the environment, but nobody does anything about it." The Environmental Policy Statement above makes it clear that the Garden is doing something about it, through education and example. In each issue of the Bulletin, "You and the Environment" will show you what the Garden is doing, what it plans to do, and what you can do to help protect our natural heritage. —Editor

Integrated Pest Management

VISITORS to the Climatron® exhibits often notice that plants are not the only living things on display; dozens of colorful zebra passionflower butterflies live among the tropical plants and tiny midges dance in the late afternoon sunbeams. The presence of insects in the Garden's display conservatories is the clearest indication that its pest control system is efficient, selective, and low in toxicity.

Integrated Pest Management, IPM for short, is a commonsense approach to the war on pests. How does this apply to plant pests and plant health care? In this day when we are coming to realize that chemicals are no longer a cure-all against pests, it means using a multi-pronged approach that emphasizes prevention. Yes, it does include careful use of chemical pesticides, but with sensible limitations and only as part of a larger pest control program. The goal, moreover, is not an artificially pest-free environment, but a balanced one, with pests controlled at a tolerable level.

All of this requires knowledge of the insects involved and observant monitoring of their activities in your garden. There are many options; use them. A good IPM program should include nonchemical remedies, such as encouraging plant vigor and resistance through sound horticultural practices and use of resistant varieties; sanitation and mechanical removal; monitoring for early warning of outbreaks and effectiveness of treatments; careful timing of treatments; and use of biological control.

Biological control means encouraging the pest's natural enemies, such as predators and parasites, to do their job. Although you can add more predators to the battlefield by buying them and releasing them, the first step is to allow the natural control agents in your area, the "balance of nature", to function naturally. There are many species of "good" insects and tiny beneficial mites. These are working for you day and night, attacking pests, free of charge. Strong, broad-spectrum pesticides hurt these worse than they hurt the pests, with the result that pesticide applications often produce resistant pests while eliminating natural controls in the area, resulting in periodic severe outbreaks of the pests, requiring more and more chemicals and furthering a "pesticide treadmill" that is hard to escape.

Pesticide use should be environmentally conservative, that is, highly selective rather than broad-spectrum, or of very low toxicity and with little or no residual action. Chemical usage should be rational, based on acknowledged need according to your scouting, not some predetermined schedule. Check for natural enemies first — do they have the battle under control? Treat only the one infested spot, not the whole area! Proper timing, or hitting the pest at the weakest stage of its life cycle, will maximize influence on the pest and minimize the need for retreatment. In most cases, well-timed spot treatments will provide an acceptable level of control with minimum impact on natural enemies and other nontargets, including humans.

IPM is now the standard procedure in the Garden's conservatories and parts of the greenhouses, and programs are being developed for the rest of the Garden. In the Climatron and Shoenberg Temperate House, for example, we have the usual range of indoor plant pests, including aphids, mealybugs, spidermites, broad mites, scale, whiteflies, and thrips. Our aphids are almost completely controlled by native braconid wasps (tinier than aphids, and stingless!) and flower hoverflies that come in through the open windows each spring since we do not spray highly toxic pesticides. Among the biological controls purchased or collected and released are green and brown lacewings, which are dependable against any soft-bodied pest; *Encarsia* for whiteflies; four types of predatory mites for spidermites, broad mites, and thrips; minute pirate bugs for any small soft pest; mealybug destroyer beetle; four species of tiny parasitic stingless wasps for scale and mealybugs; *Lindorus* scale-eating beetles; and predatory midges for aphids. Occasionally, inundative releases of ladybug beetles have been used in single areas or on single large plants as emergency measures.

It is unreasonable to expect complete eradication of any of the pests, but they are controlled at tolerable levels by IPM. Additionally, our pest control budget is less than before, the control is much better, and the greenhouses are safer for the staff and visitors. And the good bugs work twelve-hour days, seven days a week! *—John MacDougal, Ph.D.*
Conservatory Manager

New Bus Route to the Garden

For the first time, people in north St. Louis city will be able to take a direct bus line to the Garden. On Monday, August 2, 1993, Bi-State initiated a new bus route that runs from Walnut Park to the the Barnes medical complex in the Central West End, where it intersects with the new MetroLink light rail system. The bus line continues south from Barnes to the front door of the Ridgway Center. Those interested in visiting the Garden from the airport or downtown can simply take MetroLink to the Central West End station and transfer to the 13 Union Botanical Garden line.

The 13 Union Botanical Garden route begins at approximately 5:00 a.m. at Union and Delmar and runs throughout the day. The last departure from the Garden is at 9:28 p.m. For information about fares, times, and other routes, please call Bi-State Development Corporation in Missouri at 231-2345. In Illinois, call 271-2345.

RICHARD BENKOF

Shown presenting the Henry Shaw Medal to Robert Kresko (center) are Peter Raven (left) and John Wallace.

Robert Kresko Is Awarded the Henry Shaw Medal

At the meeting of the Board of Trustees on June 23, 1993, the Trustees awarded the Henry Shaw Medal to Robert E. Kresko, a Garden Trustee who served as president of the Board from 1989 to 1991. The Henry Shaw Medal, the highest honor bestowed by the Missouri Botanical Garden, was established by the Board of Trustees 100 years ago. Named for the Garden's founder, it honors those who have made significant contributions to botanical research, horticulture, conservation, the Missouri Botanical Garden, or the museum community. Since 1978 the Medal has been presented annually, usually at the annual dinner honoring major Garden donors; it is occasionally awarded at other times as well.

Board president John K. Wallace presented the medal to Kresko. In recognition of Kresko's great contributions to the Garden, Wallace said, "Bob was elected president of the Board after serving as first vice president for several years under John Biggs. Bob's highly successful leadership has been consistently characterized by strength, sensitivity and flexibility."

During Kresko's tenure as president, the Garden went through a period of extraordinary growth and activity. The Garden completed a $20.4 million capital campaign and expanded its programs to meet increasing demands for service while maintaining financial strength and stability. It saw growth in attendance, with memberships increasing by almost 5,000 households. The Garden brought the Center for Plant Conservation to St. Louis to make its headquarters here, and participated in a highly successful "debt swap for nature" with the government of Ecuador that generated more than $400,000 for expansion of botanical research in that country. The Garden undertook a study of community attitudes that has served as a basis for planning public programs and increasing service. The Board approved a Master Plan for future development of Shaw Arboretum and celebrated the centennial of the founding of the Garden's Board and the 50th anniversary of the membership program.

In conclusion, Wallace said, "Bob has continued to serve us well and is now chairing the Building and Grounds Committee during a crucial period as we move ahead with the Partnership Campaign. He has been exceptionally helpful in securing the property at Shaw and Vandeventer for the new research building and in assisting with the selection of an architecture firm.

"It is with sincere appreciation and genuine thanks for his support and his magnificent leadership that we present Bob Kresko with the Henry Shaw Medal."

CLIFF WILLIS

Shown at the dinner, from left: Patty Bush; Donald Falk, former director of CPC; Peasy Love; Peter Raven; June Kummer; Andrew Love; Fred Kummer.

Mrs. William H. T. Bush Is Honored

On June 21, 1993, the Garden hosted a special dinner in honor of Mrs. William H. T. Bush and the many dedicated individuals who participated in the Center for Plant Conservation's St. Louis Campaign for the National Collection. Mrs. Bush served as chairman of a local committee that raised more than $90,000 to endow 16 endangered plants in protective cultivation at the Garden. The Garden's plants are part of the more than 400 species in the National Collection of Endangered Plants, which is maintained by the Center for Plant Conservation through a consortium of 25 botanical gardens and arboreta across the country.

The St. Louis effort was the model for a larger campaign nationwide by committees representing the CPC participating institutions. The groups sought to raise endowment funds for the plants in their local collections. Their work was crucial to helping the CPC succeed in matching a $500,000 endowment challenge grant issued in 1988 by the Andrew W. Mellon Foundation, and which faced a June 1993 deadline. The St. Louis committee surpassed its fund raising goal by $25,000.

Committee members and donors were among the more than 50 guests attending the dinner. Committee members included Mrs. Walter F. Ballinger, Mrs. George K. Hoblitzelle, Mrs. John Klein, Mrs. John E. Mackey, Mr. and Mrs. John McPheeters, Mrs. G. Rodney Miller, Mr. Lucius B. Morse III, Mrs. Thomas Ott, and Mrs. William E. Wiese.

Dr. Peter H. Raven, director of the Garden, said, "We are deeply grateful to the committee members and the many contributors whose generosity allowed us to complete the Mellon matching grant. The National Collection is the very heart of the CPC program and our stopgap against the extinction of some of this country's most imperiled plant species. The support generated from endowment funds goes directly to maintain and expand this collection."

TIM PARKER

Carrie Lenhardt of the World Bird Sanctuary releasing the screech owl behind the Climatron.

Owl Is Rescued on Garden Grounds

LAST SPRING a gray-phase screech owl was found with a wounded wing on the grounds of the director's residence by the Ravens' daughter Katie, horticulturist Julie Hess, and Garden painter Doug Cullmann. The three rescuers took the owl to Barbara Addelson of the education division, who is an avid birder.

Addelson arranged for the owl to be cared for at the World Bird Sanctuary. An X-ray revealed that the bird's wing was badly bruised but not broken. Sanctuary staffers Katrina Meshech and Carrie Lenhardt speculated that the owl had most likely been struck by a car, then flew into the Garden. After a period of rehabilitation, the owl was released at the Garden on June 25. Screech owls may have one of two colorations, red-phase or gray-phase. Red-phase are usually more common in this area, Addelson reports, but this year more gray-phase owls have been reported. "Screech owls are not rare in the St. Louis region, but we tend to be less aware of their presence because they are nocturnal," Addelson said.

TIM PARKER

The gray-phase screech owl

HORTICULTURE DIVISION NEWS

Interns Spend Summer at the Garden

FOR MANY YEARS the Horticulture Division has sponsored summer internships for students interested in horticulture. Usually the interns come from the St. Louis area, but this year the students came from all over the country. Summer interns get experience in every aspect of professional gardening, from weeding, pruning, and watering outdoors, to greenhouse work, to administration. They also have an opportunity to spend the last two weeks of the program doing a project of their own. One intern designed landscaping for the Garden's apartment building, and another combined her interests in horticulture and journalism by writing signs for the Garden and a fact sheet on vivariums.

In the past two years the number of internships has expanded thanks to support from Monsanto Fund, which provides summer internships at the Garden to minority students majoring in plant-related studies at Lincoln University. The Lincoln University interns this summer were: Kerrin Britton, a native of St. Louis pursuing a degree in agribusiness; Brian Harvey, a native St. Louisan working toward a degree in agriculture; Julius Minor, a native of Olivette, Missouri, pursuing a degree in natural resources; and Jason Spruiell of Jefferson City, Missouri, who is majoring in sociology.

continued on next page

Front row, from left: Deborah McAdams, Kerrin Britton, Greg Schroer. Middle row: Jason Burney, Gail Shair, Jason Spruiell, Julius Minor, Brian Gnuse. Back row: Chris Hansen, Diane Brueckman, Bob Hopkins, Amy Seltzer, Brian Harvey, James Stevenson.

Building Beautiful Things at the Arboretum

VISITORS to the new Whitmire Wildflower Garden at Shaw Arboretum find more than a shady spot to rest when they sit in the garden's two new gazebos; they can delight in the beauty created by a master craftsman. Carpenter David Hicks has been on the staff of the Garden for over six years, the past three and a half spent at the Arboretum.

Hicks had his own full time business making hand-crafted reproductions of 17th and 18th century furniture before he joined the staff, and he still builds furniture in his spare time. Meanwhile, the Arboretum benefits from his expertise and meticulous attention to detail. "This is a dream job for me," Hicks said. "I live in Labadie, so I love the area, and I have always liked the Arboretum and the people who work here. Now they pay me to come!"

Maintaining the buildings at the Arboretum is a full time job in itself, but Hicks puts in extra time doing special projects like the two gazebos. One is a formal, white pillared design, and the other is a charming, rustic design that utilizes the trunks of cedar trees as its columns.

"The original concepts came from Environmental Planning and Design of Pittsburgh, who designed the wildflower area," said Hicks. "John Behrer, the manager of the Arboretum, and I took their basic ideas and developed them. For instance, we wanted the rustic gazebo to overlook the pond, so we designed and built the serpentine stone wall that supports it right at the edge of the water. I fabricated the moldings on the formal gazebo by adapting a design I found on the Manor House. We purchased the columns for the formal gazebo; everything else is my own work, including the standing-seam copper roof. I had never done one of those before, and it was interesting to learn."

Hicks also built the furniture on the porch of the Manor House and in the formal gazebo, and he has been busy drawing up plans for the interior and exterior woodwork on the Manor House, which is scheduled for renovation. He is assisted by a skilled volunteer craftsman, Adam Donges, who works with Hicks almost every day.

"I'm so lucky to get paid for doing what I love to do," Hicks said. The Garden and the Arboretum are fortunate also, to benefit from the beauty created by the hands of a master craftsman.

David Hicks (left) and John Behrer enjoy the view from the rustic gazebo in the Whitmire Wildflower Garden.

INTERNS continued

For years the Garden has found its summer interns through the American Association of Botanical Gardens and Arboreta (AABGA). This year the top six candidates were chosen from a field of 36 applicants. These interns were: Chris Hansen, working toward a bachelor's degree in horticulture from Iowa State University; Bob Hopkins, earning a horticulture degree at Western Kentucky University; Deborah McAdams, a journalism student from the University of Nebraska-Lincoln; Gregory Schroer, pursuing a degree in horticulture with emphasis on landscape architecture at the University of Missouri; Amy Seltzer, a horticulture major at New Mexico State University with an interest in genetics; and Gail Shair, a biology major at Trinity University, San Antonio, Texas. Other interns included Diane Brueckman of St. Louis Community College at Meramec, who volunteered as an intern to fulfill a course requirement; and Jason Burney from Ball State University, who is earning a degree in landscape architecture.

This summer, for the first time, there were two interns from South County Tech High School in St. Louis, sponsored by a federal program that includes work-study at the Garden this fall. The two students were Brian Gnuse, majoring in landscape maintenance and equipment operation, and James Stevenson, majoring in floral design and greenhouse operation.

In addition to its summer interns, the Horticulture Division welcomes foreign exchange students each year. These international internships last for six months to a year, and will be the subject of a future *Bulletin* article.

Chinese Herbarium Specimens Arrive

A SHIPMENT of 10,000 herbarium specimens from the South China Institute of Botany arrived at the Garden in late May. These dried plants, collected from 1930 to 1950, are the first installment of a large number of specimens that the Garden is acquiring from the People's Republic of China (PRC). About 100,000 specimens are expected to arrive from China this year.

Relatively few herbarium specimens from the PRC can be found in collections outside of China. "The Garden is extremely

CLIFF WILLIS

David Brunner, herbarium supervisor (left) and James Solomon examine some of the unusual Chinese specimens that just arrived.

fortunate to acquire these plants," said Dr. James Solomon, curator of the herbarium. "We owe the opportunity to the close relationships we have formed with Chinese botanical institutions over the years."

The acquisition represents the first time since the 1930s that a significant number of Chinese herbarium specimens has been made available to the west. It will make the Garden one of the world's major centers for study of Chinese plants. The specimens will provide invaluable information for studies directly related to the Flora of China project and for many other studies of East Asian plants.

Araceae Collection Receives Gift

THE Garden's living research collection of Araceae, or aroids, has received a major gift of plants from the private collection of Garden member Betsy Feuerstein of Memphis, Tennessee. Betsy has spent the last few years collecting Araceae in Ecuador, one of the most biologically diverse countries in the world. Many of the donated plants are expected to be species new to science.

The Garden's aroid collection, with about 6,000 living plants, is already the largest in the world. It has been developed over the past 25 years by Dr. Thomas B. Croat, P.A. Schulze Curator of Botany at the Garden.

The new plants were temporarily stored outside in the greenhouse nursery area until they could be processed by Petra Malesevich, Araceae research assistant, and Jeffrey Lake, Araceae intern from Grinell College. The two wrote descriptions, took photographs, and prepared herbarium specimens. Later, Betsy Feuerstein, Michael Chaille and Ellen Powell, fellow aroid enthusiasts from Memphis, helped to repot and retag the plants before moving them into the collection. Chaille is the owner of Godwin's Greenhouses, and Powell is a student at Shelby State Community College.

Dr. Croat said, "This contribution by Betsy Feuerstein is a very significant addition to the research collections of the Garden and will be very important in the study of Ecuadorian Araceae. It is the largest group of plants ever given to the aroid research program. We deeply appreciate the donation of these excellent plants and the selfless effort by Betsy, Michael and Ellen."

RICHARD BENKOF

VISITORS FROM MADAGASCAR -- A group of Malagasy visitors came to the Garden this summer to work in the herbarium. Three technicians working on the Conspectus of the Vascular Plants of Madagascar project, funded by the National Science Foundation, were here for a seven-week training program. In addition, Jeanine Raharilala, a staff botanist at the Parc de Tsimbazaza in Antananarivo, Madagascar, was here for four weeks of training funded by the John D. and Catherine T. MacArthur foundation. Shown from left: Jeannie Raharimampionona; Jeanine Raharilala; Sylvie Andriambololonera; Voahangy Raharimalala; and Dr. George E. Schatz, the Garden curator who supervises the Conspectus project.

RICHARD BENKOF

NEW STAFF — The international makeup of the Garden's Research Division is exemplified by Peter Jørgensen and Carmen Ulloa, who joined the research staff at the Garden last year. Jørgensen, who is Danish, is a specialist in the Passifloraceae (passion flower) family. He coordinates the Checklist of the Plants of Ecuador project, an international collaboration among the Garden, the Botanical Institute of the University of Aarhus in Denmark, the Ecuadorian Museum of Natural Sciences, and Catholic University in Quito, Ecuador. Ulloa, who is Ecuadorian, works on the Flora de Nicaragua project. The two met working in the herbarium in Quito, were married in Denmark in 1990, and earned their degrees from the University of Aarhus in 1993. "It is wonderful to work with such a large scientific staff," Ulloa said.

Garden Clubs Offer Landscape Design Course

OCTOBER 4-6, 1993, the second in a series of annual Landscape Design Courses will be offered by the Federated Garden Clubs of Missouri, Missouri Landscape Design Critics Council, and the Garden in cooperation with the National Council of State Garden Clubs, Inc. The class will be held at the William T. Kemper Center for Home Gardening. Participants need not have taken Course I to attend this year. The classes are intended for professional horticulturists and home owners.

The complete series of four courses will include a full range of landscape topics, from the problems of urban planning to selecting native plants for your own yard. Lecturers are all distinguished members of the horticulture profession, including Dr. Neil Odenwald, professor of landscape architecture at Louisiana State University. Dr. Odenwald is co-author of the award-winning *Southern Plants*, serves as a consultant for Time-Life gardening books, and is director of the garden restoration at Melrose Plantation in Natchez, Mississippi.

Attendance is limited to 70 persons. The course fee is $50; the fee for one day only is $25. For complete information and a registration form, please call (314) 532-3232 or (314) 993-1836.

Volunteer Evening

RICHARD BENKOF

Award recipients at Volunteer Evening (from left): Alma Reitz; Ann Case; Peter H. Raven, director; Vernetta Skiles; Nancy R. Morin, assistant director; and Robert "Eric" Erickson.

ON JUNE 22, 1993, the Garden paid tribute to its hundreds of dedicated volunteers with the annual Volunteer Evening celebration. Dr. Peter H. Raven, director, said, "We are gathering tonight to thank each of you for your gift of time and talent. It is impossible to overstate the importance of your contribution to the Garden, for your efforts make it possible for us to fulfill our mission and our global environmental responsibility. It is a great pleasure to work with each and every one of you, and the entire staff of the Garden joins me in thanking you for helping to make this institution the very special place that it is."

Awards were presented to several individuals. **Robert "Eric" Erickson received the Special Achievement Award**, which honors volunteers who have performed critically needed research or a special project. Eric has been a volunteer in the library for six years, where his knowledge of bibliography and the history of science has made the *Annals*, the Pre-Linnean and Linnaeana collections available to staff and other scholars.

Ann Case, Master Gardener of the Year, received the award for Extra Service Hours. Ann could easily have qualified for any of the award categories. In 1992 she gave 624 hours of service to the Master Gardeners and Garden Guides programs. She edits the Master Gardener newsletter, serves on the steering committee, works with the Plant Clinics, Plant Sales, and Speakers' Bureau, and was elected co-chair of the Guides for the current term.

The Commitment Award was presented to Vernetta Skiles for her meticulous work helping to maintain the dried plant collection in the herbarium. The Commitment Award honors volunteers who conscientiously perform tasks that are not inherently rewarding; for the past fourteen years Vernetta has performed the essential task of examining every sheet in the collection to be certain it is correctly stamped and numbered.

The Career Service Award is a new award that was created to recognize volunteers who have made repeated and substantial contributions within a single division or in several areas of the Garden over a number of years. As the first recipient, Master Gardener **Alma Reitz was honored for her work with the Horticultual Answer Service**. She was the first female "Answerman"; in the past 17 years Alma has also worked with the Master Gardeners in plant sales and recruiting, and has served weekends in the Kemper Center.

In addition, the following volunteers received **Special Recognition: Claire DePalma**, for a special project for the Controller's Office; **Jim Turner**, for his work indexing the Bulletin for the Library; **Bill Betz**, for entering tremendous amounts of information into the research database for the *Flora of Venezuelan Guayana*; **Gerry Bickel**, for her work with the public as a Master Gardener at the Kemper Center; **Jim Gossum**, for contributing his knowledge of the history of St. Louis to the archives and Tower Grove House; **Iris Guenther**, for ongoing work in plant mounting; **Suze Stark**, for her work in the Temperate House and with the Master Gardeners; **Janet Dickey**, for her work in the education program at the Arboretum; **Al Loftus**, for his curating of the Garden's architectural drawings in the archives; and **Irene Weisenhorn**, for her work in maintaining the director's garden.

Garden Guides Elect New Officers

THE Garden Guides have elected new officers to serve a two-year term, effective September 1993. The new officers are: co-chairs, Ann Case and Pat Bushman; secretary treasurer, Barbara Windsor; tour scheduler, Catherine Vanderpearl.

The Garden Guides are a group of highly skilled volunteer docents who lead educational tours of the Garden for groups of all ages and interests. Tours can be arranged by appointment; public tours are given seven days a week from May through September, and on Tuesdays, Saturdays and Sundays in the winter months. Guides must complete a demanding training program and attend enrichment classes ten months of the year to keep their knowledge up-to-date. Currently the group has 81 active members, barely enough to keep up with the ever-increasing demand from schools and organizations throughout the community.

If you are interested in the challenge of becoming a Garden Guide, please call Jeanne McGilligan at 577-5187.

Home Gardening

FORCING HARDY BULBS

FEW garden plants have the potential to yield as many rewards for the amount of effort expended as hardy bulbs. These bulbs have stored within themselves all the nutrients they will need to produce their first season's growth and bloom. They are the essence of simplicity itself. All you really need to do is to plant them in a site that has good drainage, provide them with enough moisture to get off and growing, and sit back and await the results next spring. But what if you are the impatient sort, preferring not to wait for the arrival of spring? Once again, hardy bulbs are most accommodating. The forcing process allows you to bring them indoors, even as winter perseveres outside.

The term "hardy bulbs" is used in this instance to refer to the so-called "major" spring bulbs such as tulips, narcissus (including daffodils), and hyacinths. It also includes those "minor" bulbs such as crocus, snowdrops, grape hyacinths, and scilla. It does not include paperwhites and amaryllis, bulbs that are commonly forced using different methods from those described here.

Forcing bulbs is a relatively simple operation once you understand the basic requirements. Like other gardening projects, timing is a key to success. Since the object is to bring plants into flower several weeks before their normal blooming time, it's important to get started as soon as the bulbs become available in fall.

Bulbs will vary in size and quality. Generally speaking, the larger the bulb, the better the chance for success. Only purchase sound, firm bulbs, avoiding those with soft spots. The papery white skin, or tunic, should be intact. Though we think of bulbs as being dormant, this is not so. They are very much alive and reactive with their environment. Avoid exposing them to high temperature and humidity levels.

There are four distinct phases to the forcing process. These are potting, rooting, transition, and flowering. The potting phase consists of planting the bulbs in any well-drained soil or soilless mix with a pH between 6.0 and 7.0. Good drainage is a key element here, as you don't want your bulbs to rot. It may be necessary to add lime to soils that are overly acidic. Choose soil types that are recommended for forcing. This information is often provided on the package label (or see accompanying chart).

Any container is suitable as long as it has drainage holes and is at least twice as deep as the height of the bulbs being forced. Since bulbs have all the nutrients they need to bloom. they do not need rich soil for forcing. However, if you intend to plant them outdoors after flowering, enrich the soil with 5-10-5 fertilizer applied at a rate of one teaspoon per quart of soil. Don't overdo the fertilizer, however, as too much can injure the roots. An extra dusting of bone meal won't hurt.

Fill the containers with enough soil so the tops of the bulbs are even with the rim of the pot. Add additional soil until the bulb tips are just above the soil surface, allowing at least one-half inch space for watering purposes. At this point the bulbs must be watered, either from the top, or by placing the pots in shallow pans of water until the soil surface is moist. The media should be kept uniformly moist throughout the forcing process. Excessive dryness may cause poor results.

Next is the rooting phase, and this requires a cold storage area where temperatures can be maintained between 40 and 45 degrees F for a period of 12 to 16 weeks. Slightly cooler temperatures are acceptable, but the bulbs should not be allowed to freeze.

Providing these conditions requires a little ingenuity, especially since bulbs are potted up in September and October, often before the onset of colder temperatures. However, the bulbs respond well to the gradual cooling that occurs outdoors as fall fades into winter. To minimize the heating effect from the sun's rays, choose a shaded spot outdoors. The north side of a shed or building is ideal. The best places to put the pots for cold storage are a well-mulched outdoor cold frame, a cool root cellar, or buried outdoors in a prepared trench that is kept heavily mulched. If none of these options will work for you, try this method. Lay down a bed of sand or sawdust in a protected, shady site. Set the pots on top of the sand, and cover them with two to three feet of dry leaves. Place some wire or evergreen boughs on top to keep the leaves from blowing away.

The average home basement is too warm for cold storage and will cause disappointing results if it is used. A spare refrigerator could be used as long as fruits are not stored there as well. Ripe fruits, especially apples, exude ethylene gas, which may affect the bulbs adversely.

Throughout the rooting phase, the bulbs must be kept in complete darkness, but they will need to be watered regularly if they become dry. After a minimum of 12 weeks, the pots will have filled with roots, and shoots will have sprouted an inch or two.

The bulbs are now ready for the transition phase. Pots should be moved to a semi-dark area with some light, where temperatures range about 50 to 60 degrees F. This will allow the pale shoots to green up gradually and continue to elongate. Depending on conditions, this may take four to 14 days.

Pots can then be brought into full sun and warmer temperatures until the flower buds appear. Once the buds open, a longer flowering period will result if bulbs are kept out of direct sunlight, free of draughts and where temperatures remain on the cool side. Spent blooms should be removed as they fade, but leave the foliage intact. Forced bulbs can be planted outside when the weather allows, or gradually dried off, stored for the summer and planted in the ground in fall.

With just a little attention to detail, few gardening projects will result in as much satisfaction as forcing the seasons indoors with hardy spring bulbs.

— Chip Tynan,
Horticultural Answer Service

Kemper Center for Home Gardening

Open 10 a.m. to 4 p.m. daily.

The Plant Doctor is available 10 a.m. to noon and 1 to 3 p.m. Monday through Saturday.

Admission to the Kemper Center is free with regular Garden admission.

Recommended Varieties for Forcing

Dutch Crocus: Use nine-centimeter or larger bulbs.
'Flower Record' (lavender)
'Jeanne d'Arc' (white)
'Peter Pan' (white)
'Pickwick' (striped)
'Remembrance' (lavender)
'Victor Hugo' (lavender)

Hyacinths: Use 17/18 and 18/19 centimeter bulbs for earliest forcing. Purchase bulbs that are specially prepared for forcing.
'Amsterdam' (red)
'Anna Marie' (pink)
'Carnegie' (white)
'Delft Blue' (blue)
'L'Innocence' (white)
'Ostara' (blue)
'Pink Pearl' (pink)

Iris reticulata: Use six-centimeter or larger bulbs. All cultivars are suitable; however, 'Harmony' is the best.

Muscari armeniacum: Use nine- or ten-centimeter bulbs.

Narcissus: Use DN I or DN II-sized bulbs.

Large trumpets
'Dutch Master' (yellow)
'Explorer' (yellow)
'Golden Harvest' (yellow)
'Mt. Hood' (white)
'Unsurpassable' (yellow)

Large cupped
'Carlton' (yellow)
'Flower Record' (white with orange cup)
'Ice Follies' (white)
'Yellow Sun' (yellow)

Small cupped
'Barrett Browning' (white with orange cup)

Double cupped
'Bridal Crown' (white perianth with orange center)

Miniatures
'February Gold' (yellow)
'Jack Snipe' (white perianth with yellow trumpet)
'Peeping Tom' (yellow)
'Tete-a-Tete' (yellow)

Tulips: Use bulbs that are twelve centimeters and larger. Tulips are listed by their color:

Red
'Bing Crosby' - Triumph tulip
'Capri' - Triumph tulip
'Cassini' - Triumph tulip
'Charles' - Single early tulip
'Paul Richter' - Triumph tulip
'Prominence' - Triumph tulip
'Ruby Red' - Single early tulip
'Trance' - Triumph tulip

Pink or Rose
'Blenda' - Triumph tulip
'Cantor' - Single late tulip
'Christmas Marvel' - Single early tulip
'Gander' - Single late tulip
'Preludium' - Triumph tulip

Yellow
'Yellow Present' - Triumph tulip
'Golden Melody' - Triumph tulip
'Kareol' - Double early tulip
'Monte Carlo' - Double early tulip

White
'Hibernia' - Triumph tulip
'Pax' - Triumph tulip
'Snowstar' - Triumph tulip

Lavender
'Attila' - Triumph tulip
'Prince Charles' - Triumph tulip

Orange
'Orange Monarch' - Triumph tulip

Apricot
'Apricot Beauty' - Single early tulip

Bicolored Red and White
'Leen van der Mark' - Triumph tulip
'Lucky Strike' - Triumph tulip
'Merry Widow' - Triumph tulip
'Mirjoran' - Triumph tulip

Bicolored Red and Yellow
'Abra' - Triumph tulip
'Golden Mirjoran' - Triumph tulip
'Kees Nelis' - Triumph tulip
'Thule' - Triumph tulip

Source: The Netherlands FlowerBulb Information Center

TELEPHONE HELP

The Garden has several telephone services available to assist you.

GardenLine **577-9400**
24-hour recorded information about Garden events, hours, admission and directions.Outside area code 314, call **1-800-642-8842** toll free, 24 hours a day.

Horticultural Answer Service (314) 577-5143
Monday through Saturday, 9:00 a.m. to noon. Master Gardeners are on hand to answer your gardening questions. The Answer Service does not have Saturday hours November through February.

HortLine **(314) 776-5522**
24-hour recorded gardening information is available with a touch tone telephone. You will need a brochure listing the hundreds of HortLine topics in order to use the service; you may request a brochure by calling the Kemper Center for Home Gardening at (314) 577-9440, 10 a.m. to 4 p.m. daily. **Plants in Bloom at the Garden** is updated weekly. Press 3 when you call HortLine.

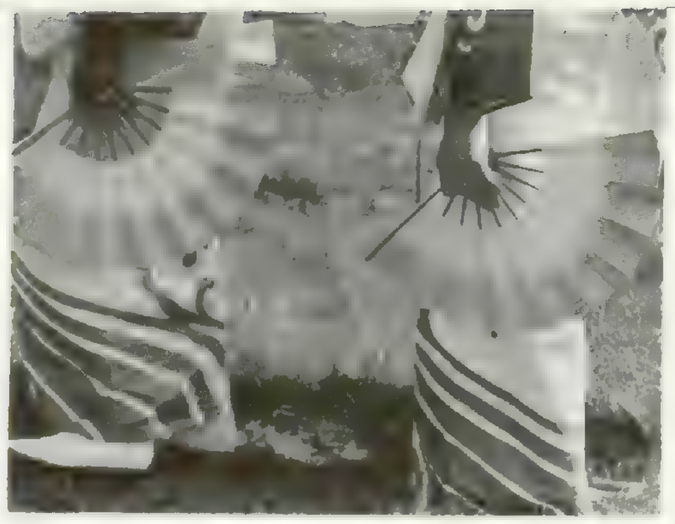
Master Composter Hotline (314) 577-9555
9 a.m. to noon, Monday through Friday. Specially trained Master Gardeners are on hand to answer your questions about yard waste management techniques. After hours leave a message and your call will be returned. The Master Composter program is supported by the Monsanto Fund.

Bulb Forcing Time Table

Name	Weeks of Cold	Weeks to Bloom
Amaryllis / Hippaestrum	none	6 to 8
Chiondoxa luciliae	15	2-3
Crocus chysanthus	15	2-3
Crocus vernus	15	2
Eranthus hymemalis	15	2
Fritillaria meleagris	15	3
Galanthus nivalis	15	2
Hyacinthus	prepared 10-12;	2-3
	unprepared 11-14	2-3
Iris danfordiae	15	2-3
Iris reticulata	15	2-3
Muscari armeniacum	13-15	2-3
Muscari botryoides var. *album*	14-15	2-3
Narcissus	15-17	2-3
Narcissus tazetta / Paperwhites	none	3-5
Narcissus tazetta var. *orientalis*	none	3-5
Scilla tubergeniana	12-15	2-3
Scilla siberica	15	2-3
Tulipa	14-20	2-3

Source: The Netherlands FlowerBulb Information Center

Calendar



september 4-6
saturday, sunday & labor day

1993 Japanese Festival -- "Flowers, Water, and Trees"

9:30 a.m. to 10 p.m. daily, Ridgway Center and grounds. Come to the 19th annual Japanese Festival and experience the beauty, fascination, and excitement of the culture of Japan. From the opening procession to the candlelight walks in the Japanese Garden each evening, there are activities and entertainments for every age and interest. For a complete schedule of events see the Sunday Post-Dispatch Everyday section on August 29 and September 4, or call the GardenLine at 577-9400 (1-800-642-8842) 24 hours a day. Regular Garden admission; tickets may be required for some events and a modest fee may apply.

Free Walking Tours

1 p.m. daily through September; 1 p.m. on Tuesdays, Saturdays and Sundays beginning October 1. Meet the Garden Guides at the Ridgway Center ticket counter rain or shine for a fascinating tour of the Garden grounds. Guides are knowledgeable about all aspects of the Garden, including the architecture, history, horticulture, natural sciences, sculpture and trees. Free with regular Garden admission.

Members' Days

september 16 thursday *"How To Rejuvenate Your Lawn"*

10:30 a.m., Shoenberg Auditorium. A slide lecture by Dr. John Kaufmann of the Monsanto Science Fellow Program, who teaches lawn care at the Garden and is involved in new product research for Monsanto. Free, for members only. Seating is limited.

october 17 sunday *Autumn Cider Walk at the Arboretum*

10 a.m. to 2 p.m., Shaw Arboretum. The Arboretum is located in Gray Summit, Missouri, 40 minutes west of St. Louis on I-44. Take a leisurely 3/4-mile hike on wooded trails lined with spectacular autumn foliage. Stop by the Trail House for a cup of apple cider. Free, for members only.

september 8 wednesday

Exhibit: "Rain Forest Diaries: Watercolors from Costa Rica"

Opening Reception: 5:30 to 8 p.m., Monsanto Hall. British artist Tony Foster will present a talk on his explorations and paintings of the pristine wilderness of Costa Rica. The exhibit will be on display 9 a.m. to 5 p.m. daily, through September 26. Regular Garden admission.

september 11 & 12
saturday & sunday

Men's Garden Clubs Show

Noon to 5 p.m. Saturday, 9 a.m. to 5 p.m. Sunday, Orthwein Floral Hall. The Greater St. Louis Men's Garden Clubs present a complete horticultural display including roses, vegetables, fruits, house plants, cacti, and home canning. Regular Garden admission.

september 16-19
thursday-sunday

Fall Plant Sale

Members' Pre-Sale: 9 a.m. to 6 p.m., Thursday and Friday. **Sale opens to the public:** 9 a.m. to 5 p.m., Saturday and Sunday. Orthwein Floral Hall and Garden Gate Shop are filled with a huge selection of bulbs, plants and gifts for the gardener. Members receive 20 percent discount, all four days. See page 19 for details.

september 18 saturday

Lehmann Building Open House

10 a.m. to 2 p.m., John S. Lehmann Building. Take advantage of a special opportunity to see what goes on behind the scenes at the Garden's research facility. Visit the rare book collection, the Shoenberg Book Conservation Center, and the herbarium, where research staff will be on hand to explain plant mounting, botanical illustration, the computer database, and more. Regular Garden admission.

september 18 saturday

Grand Opening: Mullanphy Botanical Garden Investigative Learning Center

Opening Ceremonies: 2 p.m.; open house from noon to 3 p.m. St. Louis Public Schools and the Garden are collaborating on this new elementary magnet school. Tour the renovated facility, including the new science laboratories, greenhouse, and restored formal garden. Live music and presentations mark the occasion. 4221 Shaw Boulevard.

september 19 sunday

Daylily Association Plant Sale

9 a.m. to 5 p.m., Ridgway Center. The Missouri Botanical Daylily Association holds its annual sale of plants from the Garden's daylily collection; all proceeds benefit the Garden. Come early for best selection!

september 25 & 26
saturday & sunday

Dahlia Flower Show

Noon to 5 p.m. Saturday, 9 a.m. to 5 p.m. Sunday, Ridgway Center. Exhibitors from the seven-state Midwest Dahlia Conference put on a spectacular display. Regular Garden admission.

october 1-31

Exhibit: "A Heaven in a Wild Flower"

9 a.m. to 5 p.m. daily, Monsanto Hall. The Garden kicks off its participation in the fifth annual Australia Week in St. Louis with an exhibition of watercolors by Australian artist Beryl Martin, in collaboration with the Austral Gallery of St. Louis. Australia Week is sponsored by the Australian American Chamber of Commerce. Regular Garden admission.

october 2 & 3
saturday & sunday

Historic Shaw Art Fair

10 a.m. to 6 p.m., Flora Place and Spink Pavilion. Eighty artists display their works.

october 3 sunday

"Best of Missouri" Market

10 a.m. to 5 p.m., grounds. See page 14 for details.

october 4 monday

Artist's Talk: Beryl Martin

7:30 p.m., Ridgway Center. Beryl Martin will present a slide lecture about her work on display at the Garden. Free tickets are required and available from the ticket counter in the Ridgway Center beginning September 1.

october 2 saturday / grand opening

"The Ecology of U.S. Agriculture: Past, Present, and Future"

11 a.m., Ribbon Cutting Ceremony, Brookings Interpretive Center. The exhibit will be open 9 a.m. to 5 p.m. daily through the summer of 1994. A pictorial history of American agriculture, organized jointly by the Garden, University Extension, and the University of Missouri College of Agriculture, Food and Natural Resources. Discover the evolution of modern food production and its impact on the environment. Visitors will learn about agriculture's achievements, problems, and potential solutions through visual displays, computer presentations, and hands-on activities. Free with regular Garden admission.

october 23 saturday -- november 14 sunday

Fall Flower Show

9 a.m. to 5 p.m. daily, Orthwein Floral Hall. Journey back to an old fashioned rural market scene. Carts heaped with produce, a country market stand, and an old tractor and plow form a charming background for the spectacular harvest display of chrysanthemums, sunflowers, celosia, flowering kale, amaranthus, ornamental grasses, corn, pumpkins, gourds, apples, colored foliage and seed heads in a glorious profusion of autumn color. See October 22 for the Members' Preview Party.

october 5 tuesday

Australia Cruise Travelogue

7:30 p.m., Spink Pavilion. A film on cruising to Australia and the Pacific Rim, presented by Travel Design, Royal Cruise Line and the Australian Tourist Commission. Free reservations are required; call 576-0727.

october 7 thursday

Film: "Strictly Ballroom"

7:30 p.m., Shoenberg Auditorium. A hit Australian comedy, winner of the Prix de la Jeunesse at the Cannes Film Festival. $1.50 members; $3 non-members.

october 22 friday

Members' Preview: Fall Flower Show

5 to 8 p.m., Ridgway Center. Members get an advance look at the first Garden flower show of the winter season. Entertainment, cash bar. Dinner buffet will be available at the Gardenview Restaurant; Garden Gate Shop will be open. Free, for members only.

october 23 & 24
saturday & sunday

Fall Lily Sale

9 a.m. to 5 p.m., Ridgway Center. The Mid-America Regional Lily Society hosts its annual fall bulb sale.

october 30 thursday

Town Hall Forum: "Agricultural Sustainability"

9 a.m. to 5:30 p.m., Shoenberg Auditorium. 3:30 to 5:30 p.m.: Open panel discussion with Dr. Peter H. Raven. An all-day program of workshops and seminars brings together rural and urban people to discuss ethical, environmental, and safety issues involved in the production and consumption of food. Local and nationally recognized speakers will discuss public policy, agriculture business, biotechnology, animal issues, water quality and soil. The program will conclude with an open panel discussion moderated by Garden director Peter H. Raven. Free admission.

Members

Second Annual

"Best of Missouri" Market

Sunday, October 3, 1993

10 a.m. to 5 p.m.

Admission: $2 per person for Garden members; $6 per person for the public (includes admission to the Garden); free to children under 12. $1 of every admission fee will go to support local flood relief.

Sponsored by: Commerce Bank of St. Louis; Premier Homes; Boatmen's National Bank of St. Louis; St. Louis County Farm Bureau; Missouri Soybean Association; and KIX 104.

Entertainment

Country & Western Music in Cohen Amphitheater featuring the Starlighters from Branson, Missouri

Displays

Soybean and Corn Growers, Missouri Department of Conservation, County Farm Bureau, antique farm machinery & more!

Especially for Kids

Petting Farm, Pumpkin Carver, Belgian Horses, Mother Earth, Captain Soybean, Missouri Mules & more!

Food

Brats, Barbecued Pork Loin, Deep Fried Missouri Catfish, Slaw, Potato Salad, Sandwiches, Pastries, Soft Drinks & Beer

Missouri Specialty Growers

Bowood Farms, Clarksville
Hamilton Seeds
Missouri Wildflowers Nursery, Jefferson City
Nicholson Bonsai Studio, St. Louis

Produce

Fruit
Fish
Herbs
Preserves
Soaps
Nuts
Candies
Meats
Honey
Cider
Cheeses
Sauces
Vegetables
Pumpkins
Mushrooms
Wines
Baked Goods
Relishes
Pickles
Gourds
Gift Baskets & More

Crafts

Hand-Thrown Pottery
Willow Furniture
Garden Accessories
Carved Wooden Birds
Hand-Spun & Woven Fabrics
Wooden Boxes
Clay Tile
Dried Flowers, Wreaths
Decorative Ironwork
Handmade Furniture: 17th & 18th Century Reproductions
Missouri Wildflower Jewelry
Candles & More

"Signature Collection" of MBG Plants

400 plants propagated from the Garden grounds, greenhouses, and the Arboretum, including many native Missouri species.

Special Entrances

There will be four admission entrances to the Market and to the Garden: the corner of Alfred & Magnolia; Magnolia at the Garden Club Building; Spink Pavilion on Tower Grove; and the main entrance on Shaw. For more convenient parking, arrange a car pool!

Plus—The Historic Shaw Art Fair
October 2 & 3
80 artists exhibit along Flora Place, 10 a.m. to 6 p.m. both days

This year the Market will be bigger and better than ever, with lots of new things to see and do. Be sure to visit the pumpkin carver and the petting farm!

Scenes from "Best of Missouri" 1992

Left: Bluegrass and country music set toes tapping.
Above: A genuine Missouri Mule was an honored guest.

Left: Last year crowds thronged the tent with the display booths. This year the Market will be set up in three big tents to provide plenty of shopping room. Come early, because last year the merchandise sold out!

BEST of MISSOURI MARKET

1992 Annual Report

The 1992 Annual Report of the Missouri Botanical Garden is available on request. To obtain a copy, please call (314) 577-5120 or write the Development Office, Missouri Botanical Garden, Post Office Box 299, St. Louis, Missouri 63166-0299. You may also obtain a copy in the lobby of the Administration Building, 2345 Tower Grove, Monday through Friday, 8:30 a.m. to 5 p.m.

New Smoking Policy The Garden has implemented a new policy prohibiting smoking in all Garden buildings, including the Gardenview Restaurant. Visitors are asked to refrain from smoking outdoors on Garden grounds as well.

1993 MEMBERS' TRAVEL PROGRAM

Exploring the Sea of Cortez and Baja California

NOVEMBER 12 to 26, 1993

THE fabled Sea of Cortez, with its 53 mostly uninhabited islands, is a haven for species of plants and animals found nowhere else in the world. Our tour will explore these waters in the luxurious Yorktown Clipper, a 138-passenger cruise ship with a shallow draft and great maneuverability that allows exploration into areas that larger ships could never attempt. The expedition will be led by a staff of naturalists who will enhance your understanding and appreciation of the wonders you will see. Frequent trips ashore are made possible by a small fleet of Zodiacs, motorized rubber landing craft that can be launched to explore remote beaches and secluded islands.

For more information on our special voyage to this unspoiled part of the world, please call Brenda Banjak at (314) 577-9517.

New Field Science Grants at Litzsinger Center

THE Litzsinger Road Ecology Center has awarded the first grants under its new Field Science Grant Program. The program encourages field ecological research by students and seeks to involve more teachers and their classes in hands-on, investigative field study in ecology and natural history. Currently, four projects have been funded.

Carolyn Schneider, a graduate student at Saint Louis University, is studying the interaction of two species of aphids that feed on a plant species of goldenrod growing in the prairies at the Litzsinger Road Ecology Center. Since the two species live together, they compete in the same habitat for food. The project will help determine how one species might effect the survival of another species.

Heather Seeman and Steve White, both undergraduate biology majors at Saint Louis University, and Jessica Mitchell, from Hazelwood East High School, are studying the basic biology of the lined snake, a common Missouri species found throughout the St. Louis area. These students will be establishing a colony of snakes in an enclosed area on the prairie, and will investigate the species' growth rate, longevity, population structure, daily and seasonal cycles of activity, mating behavior, and relationships to temperature.

Jeff McKinney is a graduate student at Washington University. He will study how prairie plants that grow together are able to compete and survive in the same place. Specifically, Jeff will study a species of *Senecio*, a member of the sunflower family.

Cris Hochwender, a student at the University of Missouri-St. Louis, will investigate the ways that milkweed plants defend themselves against insect predators through the production of chemicals, and thereby become resistent to those insects.

The Litzsinger Road Ecology Center, operated by the Garden's Education Division, has initiated a number of innovative outdoor environmental education programs for children and teachers. "The Field Science Grant Program allows us to accomplish two important goals," says Dr. Larry DeBuhr, director of education. "First, the projects funded will help us better understand the biology and ecology of the Litzsinger Road Ecology Center site. Second, the projects will serve as useful models that can be used for lessons with other students and teachers during future education programs. Future involvement of students and teachers in real time research projects will help to increase their level of understanding and interest in science and ecology."

New Aquatic Ecology Program

THANKS to grants of $20,000 from the Allen P. and Josephine B. Green Foundation and $16,500 from the Environmental Protection Agency, the Garden has initiated a coordinated program in aquatic ecology and water quality environmental education. This program will develop resources and materials for use at the Garden and by teachers in schools throughout the state and country for many years into the future.

Through the Education Division, the Garden has taken a lead in educating children and teachers about aquatic ecology and water quality. Since St. Louis is located at the junction of important rivers, including the Mississippi, the Missouri, and the Meramec, preservation of aquatic ecosystems is particularly important. Maintaining the biodiversity and health of wetlands in the future requires a clear understanding of the importance of these critical habitats by St. Louis children and adults today. There are six components to the overall project:

Curriculum Development: An instructional curriculum for use by grades 4-8 is being developed and tested. The instructional units will include lesson plans, activities, and background science information to help classroom teachers teach aquatic ecology and water quality.

Material Kits: A new Suitcase Science kit will be developed for loan to teachers. This kit will include the materials and supplies needed to teach the lessons in the curriculum.

Stream Ecology Journal: A "Stream Ecology Journal" for use by teachers and students has already been completed. This project will assist in the printing and dissemination of copies of the booklet to teachers and schools.

Teacher Training: A series of summer workshops will train middle school teachers to use the curriculum materials and Suitcase Science kits.

Classes for Children: Through the Henry Shaw Academy, 12 and 13 year old children can participate in a year-long stream ecology program. Many of the materials developed for this project originated from the Henry Shaw Academy, and will, in turn, be useful for future classes at the Garden.

Computer Network: The Garden is one of 90 sites connected by computer with the Technology Educational Research Center in Cambridge, Massachusetts. This computer network allows students from all over the nation to share data and information collected through field classes with other children. This year the Garden is serving as a "leadership site" for aquatic ecology projects.

The generous contributions from the Green Foundation and the EPA have allowed the Garden to increase its effectiveness in teaching children and adults in St. Louis about one of our most important ecological resources. With this understanding will come better management and stewardship of aquatic habitats as today's children become adults.

Professional Development for Teachers

FOR the first time this summer, the Education Division at the Garden has offered a comprehensive program of professional development for teachers. Teachers from as far away as Kansas City, who are teaching at all grade levels from kindergarten through senior high school, participated in a variety of programs. Instruction for the programs occurred at the Missouri Botanical Garden, the Shaw Arboretum, the Litzsinger Road Ecology Center, and in Belize in Central America.

In June, 12 senior high school teachers spent a week at the Litzsinger Road Ecology Center studying "Field Methods in Ecological Investigations" with Dr. Judith Bramble. In addition to learning important ecological concepts, participants were also able to learn about methods and techniques they can use with their students.

In late June and early July, 20 middle school teachers participated in the Garden's "Ecology of Aquatic Environments" class. This program, jointly sponsored by the Environmental Protection Agency, the Litzsinger Road Ecology Center, and the Missouri Botanical Garden, introduced the teachers to a new curriculum developed by the Garden's Education Division, and taught the teachers about aquatic environments in Missouri. Participants in this program included teachers from Kansas City, the Columbia area, south central Missouri, and from throughout metropolitan St. Louis. Participants were enthusiastic and the

continued on next page

Trail Maintenance in Jamaica's Blue Mountains

Above: Henry Shaw Academy students at work on the Jamaican Blue Mountain Peak Trail.

THE final class/field trip for the 1993 Henry Shaw Academy Explorer Field Study Program had an exciting new focus this year. Following the program's philosophy of giving back in appreciation of an experience, participants devoted an afternoon and morning to repairing erosion damage along the Jamaican Blue Mountain Peak Trail. This addition to the already comprehensive field trip was the result of months of planning between Missouri Botanical Garden Education Division and the Blue Mountain Park Department.

Students Erin Davis, Katrina Dlugosch, D'Arcy Meyer, Laura Saxton, Amanda Schulte, Paul Shearon, and Keith Watson, together with instructors Jeff DePew and Jennifer Gleason, were the first international volunteers to perform a service project in the newly created park. The 193,000 acres of steeply inclined tropical mist forests was purchased in 1991 largely through donations from the Nature Conservancy. Presently, just 10 rangers of the Blue Mountain / John Crow Mountain Conservation Department patrol the area.

Traveling to such a remote location in Jamaica was time-consuming. On June 24 the MBG group left the Hofstra University Lab Site at 5 a.m. to travel by bus to a high mountain town called Mavis Bank. From there, students and instructors crammed into a small Land Rover for the winding 1-1/2 hour trip up to the trail head.

Using shovels and pick axes, students worked for the rest of that day and the morning of the next day. Organized in small groups, they filled in eroded areas and rerouted water paths. Several small trees were cut down with machetes to create stair steps along the trail in a section called Jacob's Ladder.

Participants kept a sharp eye out for streamertail hummingbirds and the endangered swallowtail butterflies *Papilio homerus*, which are endemic to the Blue Mountain area. It was also a rare chance to examine tropical mist flora, such as mountain mahogany, blue mahoe, orchids and bromeliads. Students also visited with Rastafarian people carrying burlap sacks of onions and coffee to town markets.

The MBG group spent the night in a bunkhouse at the ranger station after hiking to an elevation of 6,000 feet. There, they were rewarded with a hot dinner and exceptional views of the tropical Blue Mountains at dusk.

Jeff DePew, coordinator of the Henry Shaw Academy, has taken students to Jamaica to study marine and tropical ecosystems for the last 12 years. He hopes to continue the Blue Mountain service project and expand it to three days next year.

The Henry Shaw Academy Explorer Field Study Program is for students ages 15-18 years old. The program is entering its seventh year at the Missouri Botanical Garden. For information contact Jeff DePew at 577-5135.

TEACHERS continued

only disappointment was the cancellation of a field trip to the Meramec River because of flood conditions. Barbara Addelson and Lydia Toth were in charge of this workshop, and were assisted in teaching of course by Jeff DePew, Susanne Reed, and Dr. Larry DeBuhr.

Also in July, 20 elementary teachers participated in "Ecology for Teachers", a two-week course that helped teachers better understand ecology and the environment. The participants investigated ecology and environmental science in the classroom and in the field. The teachers were able to practice, discuss, and evaluate instructional strategies and activities that allow them to help students in their classrooms learn about nature and ecology. Sandra Rode is coordinating this class. Barbara Addelson, Lydia Toth, Dr. Judith Bramble, and Dr. Larry DeBuhr helped teach the course.

In early August, middle school teachers participated in a workshop on "Exploring Ecology Through Inquiry." This workshop helped the participants to learn about the successful Eco-Inquiry program operating at the Litzsinger Road Ecology Center. Eco-Inquiry is a full-length ecology curriculum for middle school grades that has been tested and implemented by the Missouri Botanical Garden. Elizabeth Peterson and Sarah Coppersmith, who are Eco-Inquiry teachers, presented the workshop.

Finally, a group of adventurous teachers, including a retired college professor from Kansas, participated in a course on "Tropical Ecology of Belize." This program included a two-day workshop at the Garden, followed by an eight-day trip to Belize. During the trip to Belize, the teachers studied tropical habitats and past and present Mayan culture. Visits were made to pine savannas, rain forests, mangrove swamps, and coral reefs. Following the trip, participants again assembled at the Garden for two days. During the post-trip workshop, teachers learned ways to incorporate their new experiences and knowledge into their own teaching. Dr. Larry DeBuhr led the trip to Belize, and Lydia Toth and Barbara Addelson helped to design and present the workshops.

This summer at the Garden was a busy time for teachers. But the real work for these individuals began when they returned to their schools this fall with new ideas, activities, and methods for teaching ecology and environmental science. ■

"Gardens Come To You"

A NEW PROGRAM of the Samuel D. Soule Center at the Garden offers older adults the opportunity to enjoy the beauty of nature even when they cannot visit the Garden itself. With support from a $2,000 grant from the Arts and Education Council in 1992, the Garden has developed an exciting new outreach program called "Gardens Come To You." This summer three pilot workshops were offered at 30 community centers.

Each 90-minute presentation includes a hands-on project. "Botanical Illustration" presents a slide show of artists' interpretations of plants through history and includes a drawing workshop. "Color In Nature" demonstrates the effects of color on people and plant pollinators, and participants make a decorative nosegay or corsage from flowers. "Sumi-e, or Black Ink Painting", is a restful, relaxing Japanese art form that emphasizes shapes and gestures rather than precise reproduction of objects and encourages participants to experiment with traditional drawing materials and techniques.

"Gardens Come To You" was developed by the Garden's Education Division in response to suggestions solicited from community organizations and agencies that serve older adults. The advisory group praised the Garden's programs offered through the Soule Center, but emphasized the need to offer programs to people where they live. The Garden education staff prepared kits for each of the new outreach programs, and trains, supports and schedules a group of Master Gardeners who present the workshops in senior centers. The positive response to the pilot programs this summer has been very strong, reports LaNor Maune, project coordinator, and more workshops will be offered this fall.

CLIFF WILLIS

Master Gardener Janet Rosen teaches Sumie-e to a group at the OASIS Center at the Famous-Barr store in downtown St. Louis.

The Garden has always encouraged participation and involvement by older adults. In 1984, the Garden received an initial gift from the family and friends of Dr. Samuel D. Soule to establish programs for older visitors, and the Garden began offering daytime workshops in horticulture, cooking, and crafts, plus special tours of the grounds. Slide presentations were offered to groups meeting off the Garden grounds. By 1991, Soule Center presentations reached 2,200 older adults annually.

In addition to Gardens Come To You, the Garden has expanded its programs for older adults with Senior Days, which feature small workshops, displays, reduced admission and free tram rides. The Soule Center publishes events flyers and an attractive semi-annual brochure that lists all its programs, including workshops, Grandparents' Days, holidays, trips and tours. Participation in the Samuel D. Soule Center for Older Adults is open to all age 65 years and older. For more information, please call 577-9506.

RICHARD BENKOF

Shown beneath the arbor, from left: Temperate House horticulturist June Hutson, Mrs. Pettus, and John MacDougal, conservatory manager.

The Arbor In All Its Glory

FROM the upper level of the Shoenberg Temperate House, the arbor resembles a rich, green canopy; to strollers passing beneath, it is a shady retreat. This lovely feature of the Temperate House is the gift of Stella Cartwright Pettus in memory of her husband Charles Parsons Pettus, Jr. Mrs. Pettus dedicated the arbor "To the Glory of God."

Ten species of vines cover the arbor with a rich variety of foliage. Climbing hydrangea, *Decumaria barbara*, is known as a rooter, displaying conspicuous roots that bury themselves in crevices. The rare bay-star vine, *Schisandra glabra*, is a grasper/twiner with stem tips that spiral around supporting structures. In summer, evergreen wisteria, *Millettia reticulata*, displays dark purplish flowers that smell of cedar and camphor; six-leaf stauntonia, *Stauntonia hexaphylla*, produces very fragrant white male flowers and purplish female flowers on separate plants.

"It has been a delight to work with Mrs. Pettus," said John MacDougal, manager of the Climatron and Temperate House. "We are very grateful to her for making this beautiful and unusual feature possible."

GARDEN GATE SHOP

1993 Fall Bulb Sale

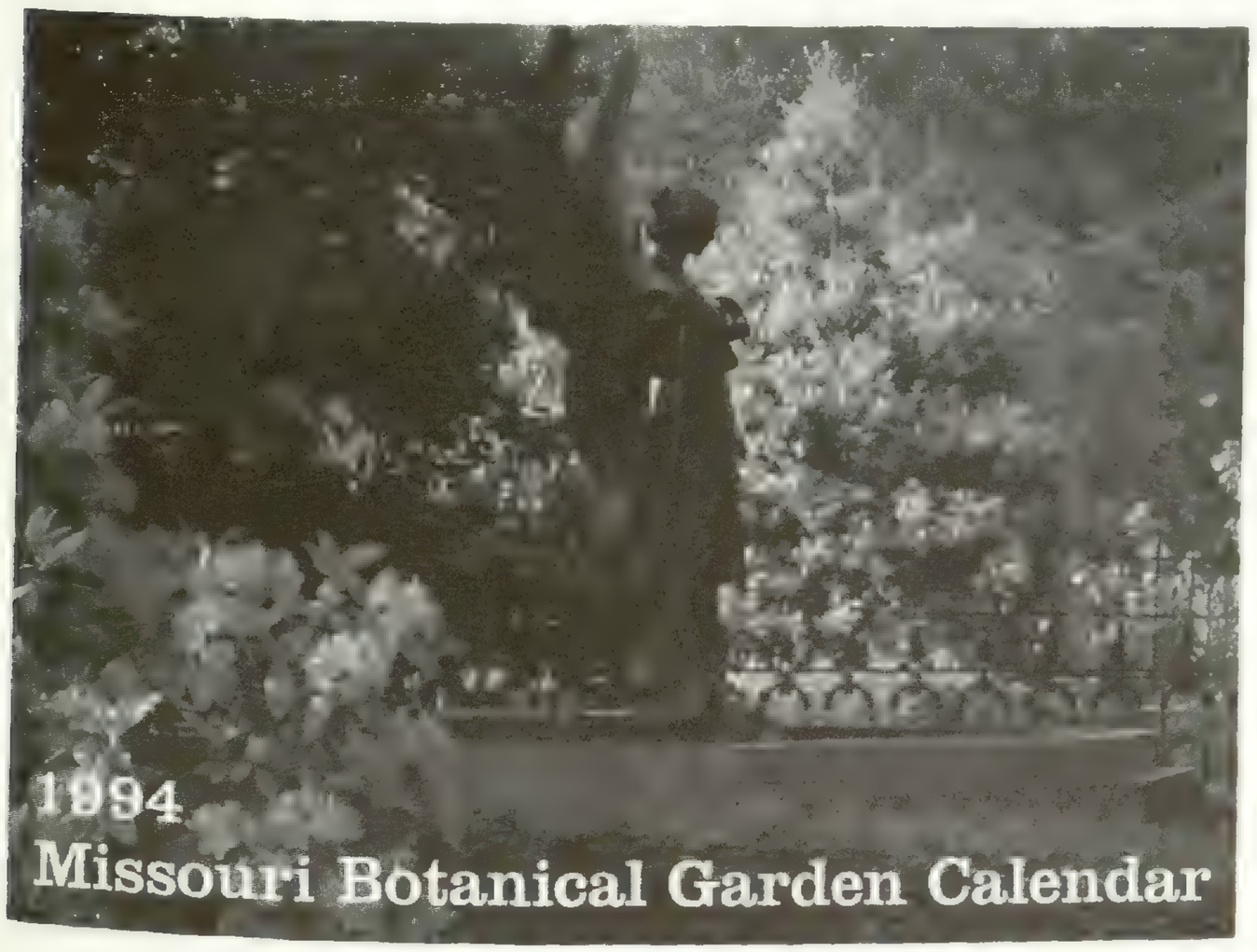
Members' Pre-Sale:
Thursday & Friday, September 16 & 17
9 a.m. to 6 p.m.
Public is invited:
Saturday & Sunday, September 18 & 19
9 a.m. to 5 p.m.

GIVE your garden a headstart on next year with a visit to the Shop's annual Fall Sale. A special display in the Orthwein Floral Hall features an enormous assortment of spring blooming bulbs with everything you need, from bulbs for naturalizing, to new varieties, to bulbs for indoor forcing, to colorful hardy mums. The Garden Gate Shop has a fine selection of garden accessories, gifts and books. Members receive a 20 percent discount on all merchandise, all four days.

A Gardener's Guide to Plant Conservation

by Nina Marshall
Published by World Wildlife Fund and The Garden Club of America
Paperback, 184 pages, $12.95

EACH year, retail nurseries and mail order catalogues tempt gardeners with a colorful array of flowering and exotic plants, from Mediterranean bulbs to native wildflowers. Few people realize that these plants often are threatened species illegally taken from the wild. To help the concerned gardener know what to buy and what to avoid, World Wildlife Fund, in association with the Garden Club of America, has published *The Gardener's Guide to Plant Conservation.* Specific chapters on bulbs, terrestrial orchids, North American wildflowers, and carnivorous plants are presented in an easy-reference format and provide the gardener with information about each species, its place of origin, and the extent to which it is cultivated. This book is highly recommended by the Garden's Horticultural Answer Service as a timely and important reference book for all gardeners.



1994 Garden Calendars

THEY'RE HERE! The new Missouri Botanical Garden Calendar for 1994 is available in the Shop and more beautiful than ever, with all new color photographs by Jack Jennings. The 16 x 12 inch poster-size calendar is printed on recycled paper.

This is Jack Jennings' 13th calendar for the Garden. To create his extraordinary images of exquisite beauty, he visits the Garden almost every day, in all types of weather. Jennings' photographs capture the ephemeral beauty of the changing seasons with their cycles of growth and bloom, preserving the timeless spirit of the Garden for all who cherish it.

The 1994 Calendar includes a handsome poster featuring the Rubiaceae family and the Garden's research program. It is available in the Shop or by mail (see form at right) for $10.95 plus postage. Members receive their usual ten percent discount.

Education Division Sponsors Nature Expeditions

Panama: Crossroad of the Americas

January 16 to 26, 1994
Join Dr. Larry DeBuhr, director of the Garden's Education Division, for an exciting trip to Panama, a focal point of biodiversity on a tiny land bridge between two continents and two vast oceans. Experience lush cloud forests, lowland rain forests, and native Indian cultures, from the lush epiphytes on the slopes of Baru volcano to the medicinal plant trail at Pamasky Nature Park.

Belize: Heartland of the Maya

February 4 to 15, 1994
Journey to the land of natural wonders and ecological diversity that nurtured the magnificent Mayan culture, led by Garden education staff members Barbara Addelson and Lydia Toth. Belize supports over 500 species of exotic birds, 250 varieties of orchids, iguanas, howler monkeys, and is one of the last wild refuges of the elusive jaguar. From the misty, pine covered mountains and dense jungles filled with crystalline rivers and cascading waterfalls, to the world's second largest barrier reef, Belize offers an unforgettable expedition. **For brochures and reservations, please call (314) 577-5140.**

1994 Calendar Order Form

Please send me _____ Missouri Botanical Garden Calendars at $10.95 each plus $3.50 postage per address. Add $1 for each additional calendar sent to the same address. To mail outside the continental U.S. call (314)577-9581.

Name_____

Address_____

City_____State_____Zip_____

Telephone_____

Enclosed is my check for $_____
payable to: Missouri Botanical Garden

Please charge:Visa/MC No:.

Exp. date_____

Name as it appears on card:

Mail to: Garden Gate Shop
Missouri Botanical Garden
P.O. Box 299
St. Louis, MO 63166-0299

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MAY• JUNE• 1993

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4.

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Beginning a new feature on the Garden's environmental initiatives and how you can help to preserve our planet.

5.

ROBERT KRESKO RECEIVES HENRY SHAW MEDAL

Robert E. Kresko, a Garden Trustee, is honored with the Henry Shaw Medal.

7.

BUILDING BEAUTIFUL THINGS AT SHAW ARBORETUM

Master carpenter David Hicks lends his artistry to new features at the Arboretum.

9.

VOLUNTEER EVENING

The Garden pays tribute to a very special group of friends and colleagues, our volunteers.

10.

HOME GARDENING

Now is the time to prepare to force hardy bulbs for a jump start on spring.

12.

CALENDAR OF EVENTS

The Japanese Festival, a major new agriculture exhibit, and the Fall Flower Show.

14.

NEWS OF THE MEMBERS

The 1993 "Best of Missouri" Market is back, bigger and better than ever!

16.

EDUCATION DIVISION NEWS

Teacher training, nature study projects, and a new program in aquatic ecology, plus the latest from the Henry Shaw Academy.

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Sunday, October 3, 1993

See page 14 for details.

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NUMBER SIX

Comment

MISSOURI BOTANICAL GARDEN MISSION: "TO DISCOVER AND SHARE KNOWLEDGE ABOUT PLANTS AND THEIR ENVIRONMENT, IN ORDER TO PRESERVE AND ENRICH LIFE."

This is truly a momentous time for the Garden. On Tuesday, November 2, voters in St. Louis City and County will be asked to vote on Proposition E, a 3-cent property tax proposal that will allow us to provide the educational and environmental programs that St. Louisans have come to expect from the Garden.

At a time of shrinking resources and tight finances for all of us, the Garden is facing demands for services and leadership that far exceed our ability to respond. Since the people of St. Louis gave us their support through property taxes in 1982, the Garden has repaid that support year after year with the highest level of performance. However, in 1982, property taxes provided over 40% of our operating revenue; today your tax support accounts for only 27% of our budget as our educational and scientific programs have grown in response to overwhelming need. The next three pages of this issue describe in detail the educational, environmental, and service programs that would be made possible by your increased support.

We feel a profound sense of obligation to continue to grow in service to the people of St. Louis, their children, and the global community, to meet ever-increasing requests for science education and research. As Garden members, I know you share our sense of moral obligation to these concerns.

The increase we are seeking from each family is so small -- less than the price of a movie ticket per year! -- and the benefits are so great for all of us. If the Garden is to continue to be a world class institution, we need the support of each of our members. We earnestly ask each of you to vote "Yes" for Proposition E on November 2 and to encourage your friends and neighbors to do the same. Together we can make the difference!

— Peter H. Raven, Director

MISSOURI BOTANICAL

NOV 02 1993

GARDEN LIBRARY

A Blooming Tribute

RICHARD BENKOF

Shown with the flowering hydrangea shrub at the Garden are officials of the Rising Star Missionary Baptist Church (from left): Deacon Tommie Walker; Deacon Albert Moore; Rev. James Kimble, pastor; and Deacon Lloyd Robinson, chairman of the Deacon's Board.

MEMBERS of the Rising Star Missionary Baptist Church of St. Louis have endowed a flowering hydrangea shrub at the Garden in tribute to the ministry and leadership of three of the pastors of the church, Rev. James Kimble (1989 - present), the late Rev. Andrew Lee Smith (1967-1981), and the late Rev. Sherman Glover (1931-1961). The Deacon/Mother Board of the church also was honored by the gift, in recognition of their hard work and unfailing support of the church and the community. The church, located at 3424 LaSalle Street, was founded in 1931. It is the only church in St. Louis that holds authorized baptismal ceremonies in the Mississippi River.

"We are both honored and delighted to have this magnificent tribute gift from the Rising Star Missionary Baptist Church," said the Garden's director, Dr. Peter H. Raven. The shrub, a *Hydrangea paniculata* 'Tardiva', is tagged and located at the east end of the patio outside the Ridgway Center. The shrub blooms in August and September.

Moving?
Please remember to send us your new address.

To avoid missing any of your membership mailings, we need notification of your new address at least three weeks before you move. Please enclose the mailing label on the back cover of this *Bulletin* and mail to:

Name:_____

Old Address:

Street_____

City_____

State_____ Zip _____

New Address:

Date effective:_____

Street_____

City_____

State_____ Zip_____

On the Cover

Students at the new Mullanphy-Botanical Garden magnet school with teacher Alicia Ivory House

Photo by Cliff Willis

Editor

Susan Wooleyhan Caine
Missouri Botanical Garden
P. O. Box 299
St. Louis, MO 63166-0299

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The BULLETIN is sent to every member of the Garden as a benefit of membership. For a contribution of as little as $45 per year, members also are entitled to: free admission to the Garden, Shaw Arboretum, and Tower Grove House; invitations to special events and receptions; announcements of all lectures and classes; discounts in the Garden Gate Shop and course fees; and the opportunity for travel, domestic and abroad, with other members. For information, please call (314) 577-5108.

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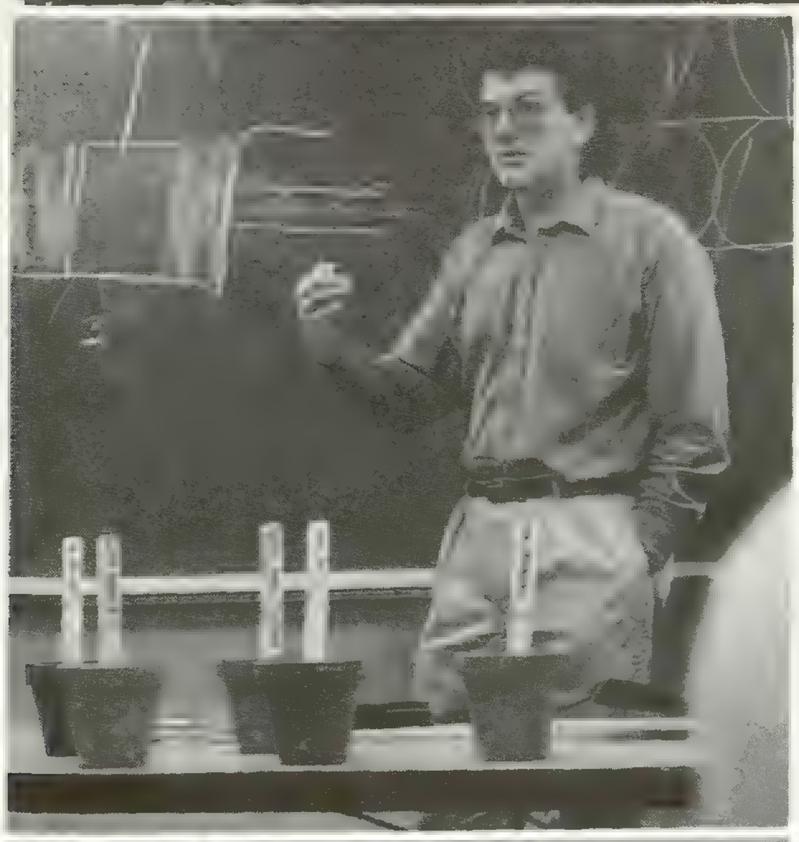
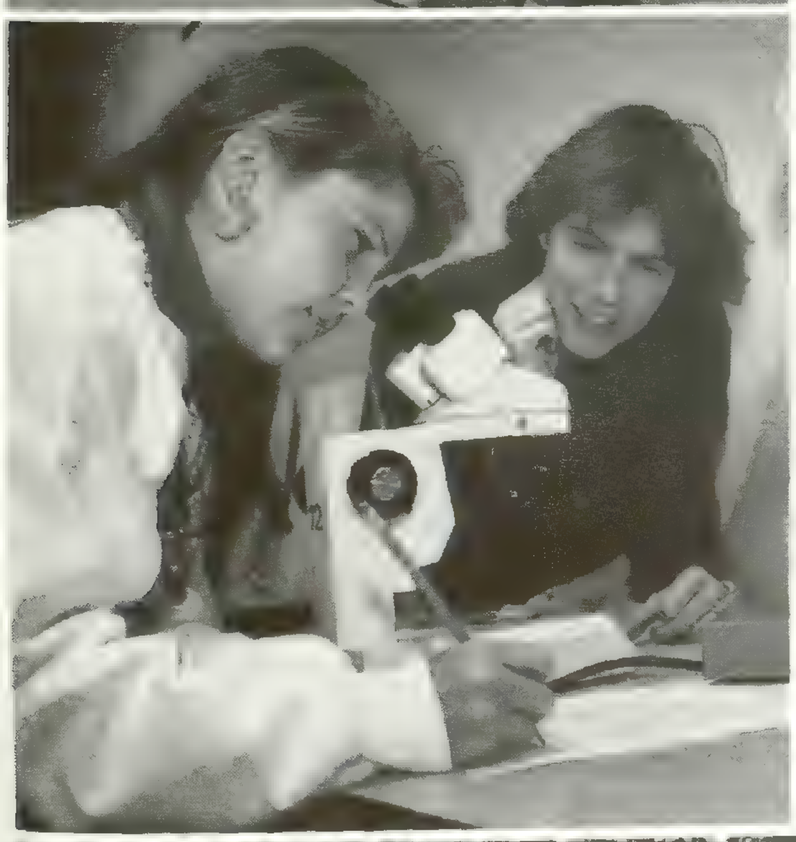


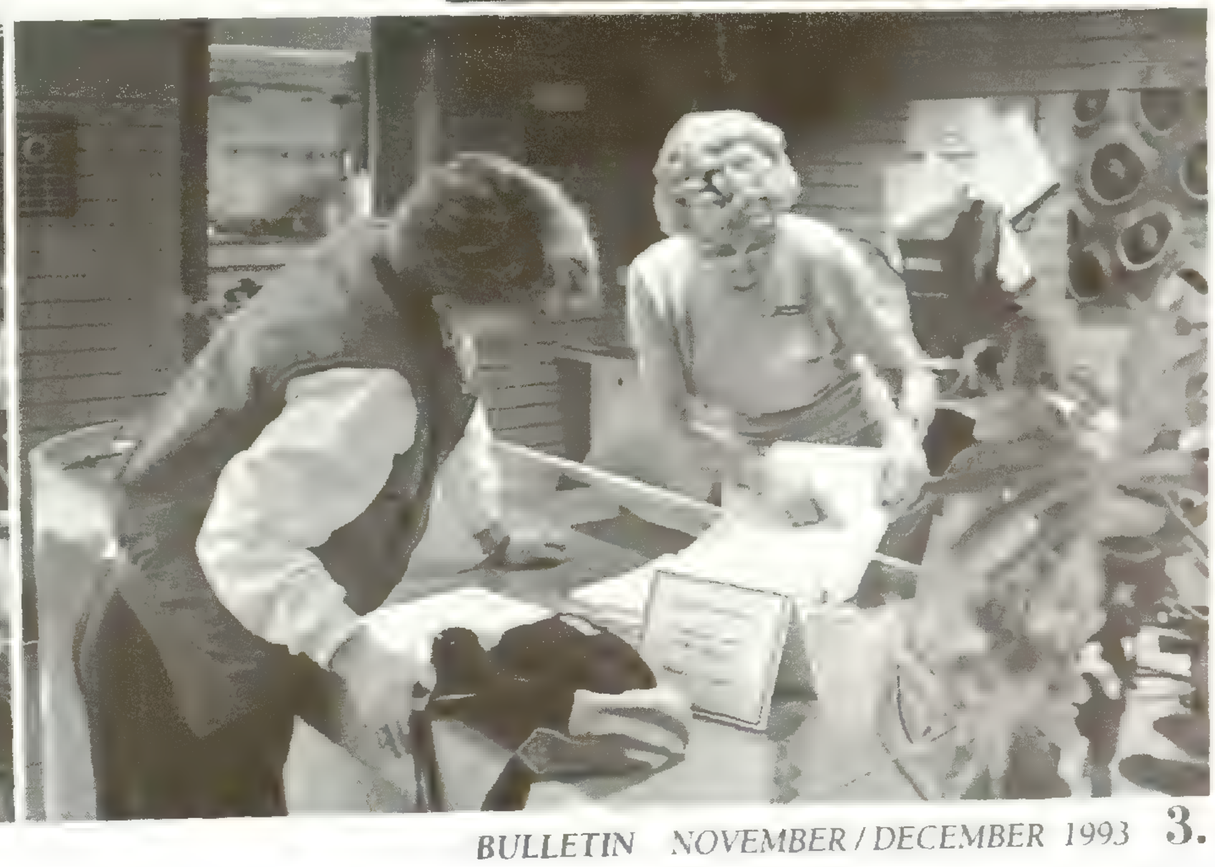
Education & Environment

"Last year my class got involved in the Garden's educational programs. My kids learned about the diversity of the plant kingdom and the importance of respecting our environment. It's a lesson they'll need for the future and one I wish more kids could get. Proposition E makes that wish a reality." *--Linda Casey, 5th grade teacher*

Vote YES on Proposition E
November 2, 1993

Continued inside





Paid for by Everybody for E (Education & Environment),
Missouri Botanical Garden, Rev. Earl E. Nance, Jr., Treasurer

E is for Everybody...

On November 2, St. Louis City and County residents will vote on Proposition E, a 3-cent property tax proposal to support vital programs at the Garden.

As Garden members, you already help to support the Garden's services to the St. Louis community. You are knowledgeable about the Garden's world-renowned research program, which helps to provide the basic information crucial to the conservation of our natural resources. You are a member of the Garden because you care about the quality of science education in our schools, you care about our global environment, and you are concerned with efforts to understand, preserve, and utilize our biological heritage in a responsible way.

The Garden's success in education and research has led to rapidly increasing requests for our services, placing unprecedented demands on our financial resources. Proposition E will ensure that the Garden can continue to serve your concerns and meet the needs of the community.

E is for Education

Today the Garden must turn away almost half of the requests it receives for educational programs every year, due to lack of funds. This amounts to more than 100,000 children and adults who are eager to learn more about nature and the environment. Proposition E , which is endorsed by the Missouri NEA (National Education Association), will make it possible to meet the demand for the Garden's educational programs by paying for:

Ancistrocladus korupensis, ***discovered by Garden researchers, has shown activity in early laboratory tests against HIV, the virus that causes AIDS.***

Community Outreach

Hundreds of organizations request Garden programs at their locations every year, but currently fewer than ten percent of these requests can be satisfied. The Outreach Program would take educational programs to schools and community centers.

Special Senior Education

With Proposition E the Garden would train a corps of individuals to work with groups of older adults to develop and complete educational and community service projects.

Teacher Training

The Garden's Education Division already has made a major commitment to improving the quality of science education in St. Louis. Helping teachers to understand and communicate better about science yields far-reaching benefits for all students, now and in the future. Proposition E would provide greatly expanded opportunities for workshops, seminars, and summer institutes for elementary, middle school, and high school teachers.

Interpretive Exhibits

This program would provide for more demonstrations, activities, and lessons using the living exhibits in the Climatron® complex, outdoor display areas, and the Brookings Interpretive Center.

Youth Corps

This program would recruit, train, and supervise young people to work on environmental projects in the community, such as recycling, community beautification, stream clean-up, and restoration of natural areas.

E is for Environment

Environmental issues are a major focus of all educational programs at the Garden. In addition, the Garden's Research Division works all over the world to find, document, and understand Earth's botanical resources before many of them disappear forever. The Garden is a global leader in sharing and disseminating the basic scientific information that is crucial for planning by environmentalists, conservationists, land use managers, and others.

In addition, Garden scientists work directly with the National Cancer Institute to collect plants to be screened for potential sources of drugs to fight cancer, AIDS, and other devastating diseases. Garden researchers also collect plants for Monsanto Company, which seeks plants that may be utilized for agricultural and pharmaceutical benefits.

Proposition E will aid the expansion of these kinds of vital research efforts by helping to pay for administrative support services right here in St. Louis.

What Else Will Proposition E Support?

Many of the Garden's historic buildings are in urgent need of repairs and renovation, including the Desert House, built in 1913; the Administration Building, built in 1849 as Henry Shaw's townhouse at 7th and Locust and moved to the Garden in 1909; the Linnean House, built in 1882; and the Museum Building, built in 1859.

How Much Does Proposition E Cost? Less Than a Dime a Week!

While the Garden has continued to expand and improve its services in recent years, our tax support has actually declined. When voters first approved tax support for the Garden in 1982, property taxes provided more than 40% of Garden revenue. Today taxes provide only 27% of the Garden's revenue.

Under Proposition E, the owner of an $80,000 home in St. Louis will pay $4.56 a year, or less that a dime a week -- a small increase that is vitally important to improve the education of children and adults and to help preserve our environment!

YES on prop. e NOV. 2

We urge you as Garden members to support Proposition E on November 2.

Everybody for E!

Paid for by Everybody for E (Education & Environment),
Missouri Botanical Garden, Rev. Earl E. Nance, Jr., Treasurer

TIM PARKER

New Mullanphy Botanical Garden Magnet School Is Open!

On September 18, 1993, more than 500 people celebrated the grand opening of the new Mullanphy-Botanical Garden Investigative Learning Center (ILC) at 4221 Shaw Boulevard. The new ILC is the result of years of collaboration and planning between the Garden the St. Louis Public School District, the University of Missouri-St. Louis, the St. Louis Science Center and the Saint Louis Zoo. When renovations are completed, the school will have an enrollment of 584 students and feature three science labs, a math lab and a computer lab, outdoor gardening space, and a greenhouse. The complete curriculum is designed to develop students' skills in problem solving and productive thinking. Alicia Ivory House, the Garden's Magnet Program instructor, develops and coordinates curriculum with the school while continuing to conduct magnet programs at the Mason Middle School.

Above: Dr. Larry DeBuhr, director of education at the Garden, with students at the opening ceremonies for the Mullanphy-Botanical Garden ILC. Below: A parade was part of the celebration.

TIM PARKER

Winner of the Ernest E. Just Scholarship Announced

TIM PARKER

Kevin (center) with his mother and father, Audrey and Ed Ferguson.

KEVIN LAMAR FERGUSON, a senior at the University of Missouri-Columbia, has been awarded the 1993 Ernest E. Just Scholarship by the Garden. The $5,000 renewable scholarship is open to undergraduates who have completed their sophomore year and demonstrated academic success and interest in science; the preferred recipient is an African American science student from St. Louis. The first Just Scholarship was awarded to Pamela Hughes in 1992.

Ferguson is working toward a degree in biochemistry at Columbia, where he became involved with INROADS, a program of career development in business and industry for talented minorities. He has served as president of Mortar Board and has held offices in other campus leadership organizations; he has received the Brooks Scholarship for academic achievement and the Chancellor's Leadership Award, among other honors.

In 1990 Ferguson worked as a summer intern for Monsanto Co. and has worked for the company every summer since. He also works as a laboratory assistant at the Agricultural Experiment Station at the University. Ferguson plans a career in industrial research.

The Just Scholarship is named in honor of the African American scientist Ernest E. Just of Howard University. Dr. Just devoted his life to the study of cell biology, published two major books and over 60 scientific papers, and received the 1915 Spingarn Medal, the highest award of the NAACP.

The Just Scholarship is funded through the support of Daniel and Adelaide Schlafly of St. Louis, who have provided support for minority education programs throughout St. Louis for many years.

XVI International Botanical Congress Will Be Held in St. Louis in 1999

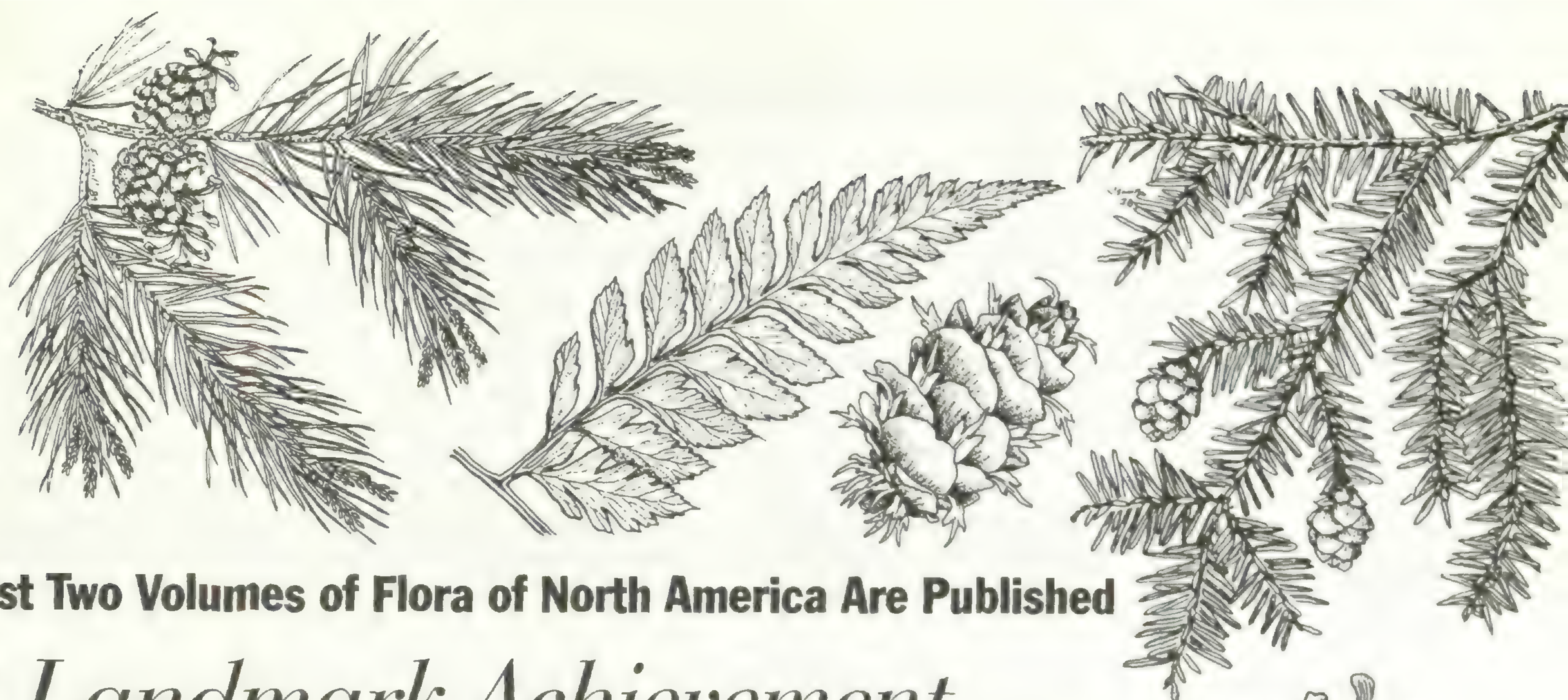
THE world's foremost meeting of biologists and botanists, the International Botanical Congress, will be held in St. Louis, July 25 to August 7, 1999. The event is held every six years and has not been held in North America since 1969. The announcement was made in September at the XV International Botanical Congress in Yokohama, Japan.

More than 5,000 scientists are expected to attend the Congress in St. Louis, which will be held in the Americas Center downtown. The Garden will be the host for the Congress, together with Washington University, St. Louis University, University of Missouri, University of Illinois and Southern Illinois University, Monsanto Company, and many scientific societies and other organizations.

Dr. Peter H. Raven delivered one of two keynote addresses in Yokohama, to open the Congress. The lecture, "Plants and People in the 21st Century," was attended by the honorary patrons of the Congress, Crown Prince Naruhito and Princess Masako. Over 4,000 botanists and biologists from 66 countries attended the Congress, which featured 1,100 lectures and over 200 symposia. A delegation of 12 scientists from the Garden attended the meeting.

"This is very good news for St. Louis," said Raven, "and we are very proud to be helping to bring an international gathering of this significance to our city."

Above: Crown Prince Naruhito and Princess Masako greet participants at the conference. Dr. Peter H. Raven, who delivered the keynote address to open the meeting, is in the group at right.



First Two Volumes of Flora of North America Are Published

A Landmark Achievement

AFTER eleven years of hard work by hundreds of botanists at more than 30 institutions, the first two volumes of the *Flora of North America* were published by Oxford University Presss on September 27, 1993. The Garden serves as the organizational center for the project.

"This is an event of tremendous significance, and we are extremely proud to be a part of it," said Dr. Nancy R. Morin, assistant director of the Garden and convening editor of the FNA project. "No continental flora has ever tried to do all of the things we're doing. There has never before been one place to obtain all of the information this project is providing."

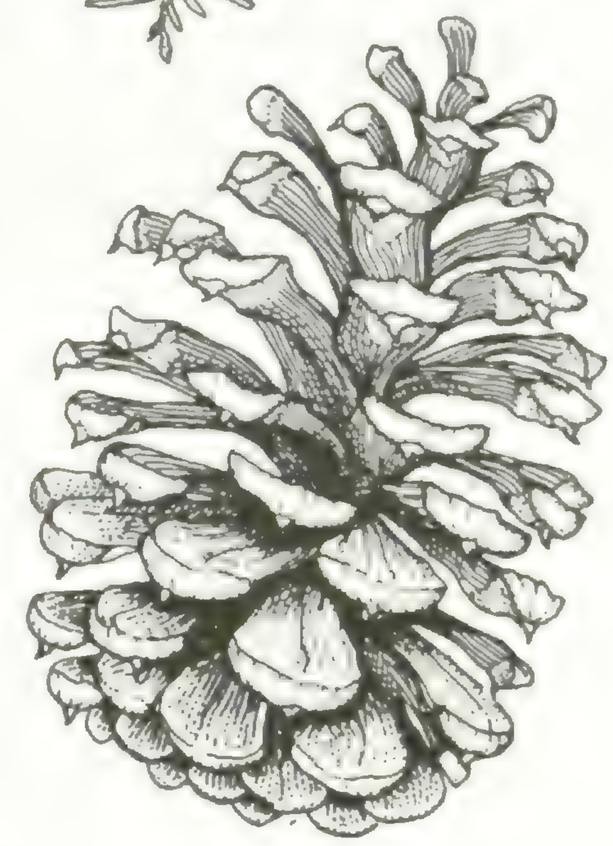
When it is complete in 12 years, FNA will consist of 14 volumes and a computer database, providing the first comprehensive description of all plants growing naturally in the United States, Canada, and Greenland. The FNA database will be continuously updated and maintained at the Garden as a permanent resource.

TROPICOS, the database developed at the Garden, is one of the largest botanical databases in the world. Its use for FNA will allow the floristic information to be utilized in exciting and productive new ways. A comprehensive bibliographic database is being developed at the Hunt Institute for Botanical Documentation at Carnegie Mellon University in Pittsburgh.

The first volume of FNA consists of introductory essays by about two dozen botanical authorities on climate, geology, history of vegetation, expeditions and research, botanical classification, and how to use the published volumes. Volume 2 contains taxonomic treatments of ferns and gymnosperms.

The publication of the FNA project represents the culmination of efforts that actually began more than 160 years ago, with the attempt by botanists John Torrey and Asa Gray to produce a comprehensive flora of the continent. "Until we began using computers, the form of floristic studies had changed very little since the 17th century," Morin said. "Now we can utilize the most up-to-date data in extremely productive ways that would have been impossible just a few years ago."

FNA has been generously supported by the National Science Foundation, the Pew Charitable Trusts, the David and Lucille Packard Foundation, the Surdna Foundation, the Dula Foundation, the ARCO Foundation, the Chase Garvey Foundation, the Hewlett Foundation, and the National Fish and Wildlife Foundation.



The illustrations on this page are from* Pteridophytes and Gymnosperms, *Volume 2 of the Flora of North America.

The Flora of North America project held its annual meeting at the Garden October 10-11, 1993. The final editors for the first two volumes are shown here (from left): David Whetstone, Rick Spellenberg, Ted Barkley, and John Packer. Not pictured: John Strother.

NATURAL HOLIDAY DECORATIONS

THIS YEAR decorate your Christmas tree solely with natural materials or in combination with your own treasured heirlooms. The simplicity and beauty of natural materials are reminiscent of earlier holiday traditions but they can also make a timely environmental statement. What better way to say you love the natural world than to give nature's little masterpieces a prized location in your holiday decorating? Collecting and making natural decorations can also be a rewarding family activity. Nature hikes around your yard or in the woods can provide a wealth of materials for your tree and also show your children how plants grow and reproduce.

Children love making natural ornaments, but they're not just for kids. Adults of all ages will find using natural materials a delightful and creative activity. Your design choices are almost endless. You can have a whole collection of unique ornaments or make up several of the same design. If your goal is a more refined, "decorator" style tree, I recommend using only two or three different styles of ornaments to give greater unity to your design.

Posies can be laid on the Christmas tree branches, tied on with ribbon, or hung with ribbon or wire hangers. Other ornaments can be made from cones and pods glued together to make common or fanciful animal forms. With adult supervision, a glue gun makes the work quick and easy. White glue can also be used but more care is needed to keep the pieces from shifting while they dry.

Below is a selection of just some of the wonderful materials available for use in making natural ornaments. Let your imagination and Mother Nature be your guide.

Pine Cones — Pine and spruce cones are readily available in the fall. They can be hung "as is" or decorated. Try gluing on various seeds or glue cones together to form pine cone "animals". If some cones are not fully open they can be opened by placing them in a warm oven for 15-30 minutes. As they dry the cones will open and release their seeds.

Another idea for pine cones is to use them to make fireplace starters. Start by melting the ends of used candles or paraffin and dip the cones into the melted wax. Place the cones on waxed paper or old newspaper until the wax is cool. Put a few in a plastic bag tied with a ribbon and you have a great gift for a friend with a fireplace. A few of the cones work beautifully for starting a fire, using materials that many people would simply have tossed in the trash.

Acorns — Squirrels love acorns, so if you want any you need to act fast. There are many different sizes and shapes, so go collecting in several areas. Bur oak is especially choice, with its large acorn and large shaggy bur. When collecting, take a field guide to trees and learn to identify some of our majestic oaks. They are quite easily identified by their mature acorns.

After collecting your acorns it is wise to place them in the freezer for a couple of days. This kills any insects that may be inside. If you don't you may end up with a box of "fish food". The adventurous child may find this exciting but mom and dad may not be quite as thrilled.

Pods — Several plants have interesting pods that are useful for decorations. Unicorn pods, *Martynia*, are often used because of their unusual shape that lends itself to creating fanciful creatures. Though too late to plant this year, the unicorn plant is an annual vine that can be grown in St. Louis. Another interesting pod is that of the southern magnolia, *Magnolia grandiflora*. To keep the brightly colored seeds from dropping out, use a small drop of glue on each one. Another readily available pod is sweetgum — and who wouldn't just love for you to come and collect theirs! Use them alone or tie several together with a ribbon. They can also be used to make "creatures".

Citrus Peels — Cut peels of orange, lemon and lime into petal shapes, make a hole in the edge of each piece, dry for two weeks, and then use florist's wire to form the "petals" into "flowers". Thin peels will dry faster and there is less chance of mold forming.

By cutting different shaped petals you can make several different kinds of flowers. Put five petals together for a single rose. Use four pointed pieces to make dogwood flowers. Another idea is to cut citrus rinds in long strips. After the strips are dried (it doesn't matter if they curl during drying) cut the strips into six-inch lengths. Combine the strips with other dried materials, such as flowers or stick cinnamon, in a posy.

Annuals, Perennials, and Shrubs — There is a great wealth of material here for use in posies. A few of my favorites are annual and oriental poppy pods; Queen Anne's lace; money plant, *Lunaria*; onions; daylily pods; iris pods; gas plant, *Echinops*; and spore fronds of ostrich fern. Dried flowers you can obtain from your garden or purchase from the florist are statice, sweetheart roses, larkspur, strawflowers, celosia, yarrow, *Gomphrena*, baby's breath, German statice, hydrangea, *Liatris*, Chinese lantern, dusty miller, and *Artemesia* branches for filler, staghorn, sumac, fruit heads and goldenrod. All of these are very easy to air dry. Just tie them in small bundles and hang them upside down in a warm, dry location away from direct sunlight. In seven to ten days the flowers should be dry.

Wheat, Barley, and other Grasses — Grains and grasses are wonderful additions to the naturally decorated tree. Grains can be purchased at craft shops, but grass seed heads are all around just begging to be collected and enjoyed free of charge. Small bundles of grains and grasses can be tied together with a ribbon and tied on the branches or secured with wire if needed. The light, airy effect of grasses is especially nice when combined with dried flowers or other dried material in a posy. Their soft, filler effect helps to show off the dried flowers. Be sure to collect plenty. If you are very ambitious you can also try your hand at making some woven wheat ornaments. I haven't tried this, but resources at your local library can provide directions.

How to Make a Posy

A posy is simply a handful of flowers that are fastened together with fine wire or florist's tape.

To make a posy, select flowers and other dried material that complement one another. Several sprays of feathery white

continued on the next page

YOU & THE ENVIRONMENT

MISSOURI BOTANICAL GARDEN ENVIRONMENTAL POLICY STATEMENT

The mission of the Garden is to discover and share knowledge about plants and their environment, in order to preserve and enrich life. Accomplishing this mission depends on the responsible management and conservation of the world's biodiversity. The quality of human existence depends on an environment that is healthful in all respects. For these reasons, the Garden places major emphasis on educating individuals to take responsibility for the overall quality of the environment. In addition, the Garden promotes public understanding of environmental issues locally, nationally, and internationally.

Particular goals of the Garden's programs are the conservation of biodiversity, sound horticultural practices, international understanding and action, and the responsible use of all resources. The Garden emphasizes these goals in its own activities and encourages individuals and other organizations to do so as well.

Pitching In! *Recycling Means Everything*

MANY OF US have been recycling old newspapers, aluminum cans, and other materials at home, working to reduce the volume of solid waste in our landfills. The Garden, too, has recycled many items for years and has had a major program in place since 1990, when we began systematic, Garden-wide collection of waste paper for recycling.

As of October 1, 1993, the Garden has launched an institutional program of significantly greater scope. Convenient collection centers have been established in all office and maintainence areas at the Garden, where staff now can collect almost all paper, plastics, metals, and glass solid waste generated at the Garden. A single vendor collects all of the containers and generates a yearly report on each category by weight.

The volume of recycled materials is expected to increase. Now the staff can collect much of their office paper waste in a single container: phone books, magazines, newspapers, junk mail, envelopes and window envelopes, Tyvek® envelopes, and fax paper. Separate containers are provided for computer paper, white and colored office paper, and cardboard. Clear and colored glass, plastics with a recycling code stamp, metal cans, and aluminum cans are all collected as well. The Garden also recycles styrofoam, including loose "peanut" type packing material, which must be placed in a plastic bag.

As a further measure to help decrease paper waste in landfills, the Garden uses only recycled paper containing at least 10-15 percent post-consumer waste for all of its printing needs, subject only to availability of the paper stock. Demand for these types of papers has grown substantially in recent years, with resulting improvements in pricing and availability. In addition, the Garden uses only recycled paper products for all of its restrooms and housekeeping needs, and all inter-office memos and documents are copied on both sides of the paper.

Regarding the expanded collection of recyclable materials, Paul Brockmann, director of General Services for the Garden, said, "This increase in service is available because we now have one vendor, Helping Hands Recycling Center, Inc., which will come to the Garden to collect all of these items. In the past, materials collected for recycling had to be taken by Garden staff to several collection points in the city, a very time-consuming process. We appreciate the staff's willingness and cooperation in the recycling program, which has already yielded substantial results. With this new program in place, there is no reason why waste baskets should have any type of office paper in them at the end of the day."

HOME GARDENING continued

flowers or grey foliage interspersed with more colorful flowers will give a nice effect. Hold the flowers together and wrap just below the flowers with fine wire or florist's wire. If a more secure posy is needed, wrap a couple of stems together first and keep wrapping as you add more pieces of dried material. When you have finished wrapping, cut the stems to a uniform length. If you like, tie a ribbon at the base to cover the wire and give the posy a finished look. If you are keeping your decorations totally natural, use strips of raffia or grass leaves in place of the ribbon.

—by Glenn Kopp, Instructional Coordinator for Adult Programs

Jean Fike (center) with Claudia Spener and Mary Middleton of the Garden's Development Office.

New Demonstration Garden

For the Birds

THE beauty of birds and their songs are so highly prized in landscapes today that many gardeners are incorporating special features and plantings specifically to entice birds to their gardens.

The Bird Garden will be situated along the main walk to the Kemper Center for Home Gardening. It will include a variety of elements with "bird appeal," such as evergreen screens for shelter, shrubs laden with berries for food, bird houses, feeders, and a bird bath sculpture. While strolling the Bird Garden's circular stone path, visitors in summer can watch tiny ruby throated hummingbirds sip nectar from the scarlet flowers of a trumpet vine, learn more about birds from interpretive panels, or relax in the stone paved seating area.

The Bird Garden has been made possible by a bequest from the estate of the late Harry W. Lang, a native St. Louisan who grew up on Cleveland Avenue not far from the Garden. Mr. Lang was an investment broker with Edward D. Jones & Company. According to his niece, Jean Fike of Kirkwood, her uncle was a man of extraordinary energy, who walked to his downtown office every day from his home in Holly Hills.

Calendar

continuing

Fall Flower Show

9 a.m. to 5 p.m. daily through Sunday, November 14, Orthwein Floral Display Hall. Free with regular Garden admission.

november 4-6
thursday-saturday

Holiday Preview Sale

9 a.m. to 6:30 p.m., Thursday and Friday; 9 a.m. to 5 p.m. Saturday. Garden Gate Shop. See page 11 for details.

november 5-28
friday-sunday

Photography Exhibit by Sir Peter Smithers

9 a.m. to 5 p.m. daily, Ridgway Center. Dramatic, oversized floral studies by the award-winning photographer Sir Peter Smithers provide vivid closeups of a wide variety of plants. Free with regular Garden admission.

november 10 wednesday

Building a Backyard Wildlife Refuge

7:30 p.m., Ridgway Center. Representatives from the Missouri Department of Conservation will show you yow to develop a backyard habitat for attracting and maintaining local wildlife. Seating is limited to 70 and advance reservations are required: please call (314) 577-5125 before November 5, 1993. Free.

Members' Days

november 16 tuesday *Holiday Decorating*

1:30 p.m., Shoenberg Auditorium. Join the floral designers from Botanicals on the Park for a dazzling demonstration of holiday decorating. Learn to create spectacular tabletop displays for your home. Free, for members only. Seating is limited.

december 11 saturday *Holiday Choral Concert*

11 a.m. and 2 p.m., Shoenberg Auditorium. Performances by the Chamber Singers of the St. Louis Children's Chorus. Free, for members only. Seating is limited.

november 11-12
thursday-friday

Conference on Race & Science

Washington University Women's Building. Sponsored by the Garden, the American Culture Studies Institute, and the African and Afro-American Studies Program at Washington University. Please call (314) 935-5690 for more information.

december 1 wednesday

Carols in the Garden: A Winter Night's Festival

4 to 9 p.m., grounds. Includes the Tower Grove House Candlelight Tour, 4:30 p.m. to 7:30 p.m. Please see the back cover for details.

december 3 friday

Members Preview: Holiday Flower Show

5 to 8 p.m., Ridgway Center. Entertainment, cash bar. Dinner will be available in the Gardenview Restaurant. The Garden Gate Shop will be open for a special Members' Sale Preview. For members only.

december 4 — january 2
saturday — sunday

Holiday Flower Show

9 a.m. to 5 p.m. daily, Orthwein Floral Display Hall. A delightful display featuring 50 living Christmas trees in 15 different varieties, plus traditional holiday blooming plants. Free with regular Garden admission. See December 3 for Members' Preview.

december 5 sunday

Holiday Tea

3 to 5 p.m., Tower Grove House. Advance reservations are required; call (314) 577-5150. Please see page 11 for details.

december 7, 9, 13, 15

Holiday Luncheons

Noon, Tower Grove House. Call (314) 577-5150 for reservations beginning Friday, November 12. See page 11 for details.

december 9-11
thursday-saturday

Holiday Plant & Gift Sale

9 a.m. to 6:30 p.m., Thursday and Friday; 9 a.m. to 5 p.m. Saturday. Garden Gate Shop. See page 11 for details.

december 12 sunday

Chanukah Celebration

Ridgway Center; times to be announced. Celebrate the Festival of Lights with traditional music and more. Co-sponsored by the Garden and the Jewish Community Center Association. Free with regular Garden admission.

december 16 thursday

Christmas Celebration

10 a.m. to 3 p.m., Ridgway Center. Join the fun with traditional carols, music, Santa, and festivities. Free with regular Garden admission.

december 26 sunday

Kwanzaa Celebration

Noon to 5 p.m., Ridgway Center. Celebrate the rich cultural roots of Americans of African ancestry with a day of family-oriented activities. Free with regular Garden admission.

Free Walking Tours

1 p.m. Tuesdays, Saturdays and Sundays. Meet the Garden Guides at the Ridgway Center ticket counter, rain or shine, for a fascinating tour of the Garden. Free with regular admission.

NOV/ DEC 1993

Tower Grove House *A Victorian Holiday*

TAKE A JOURNEY back in time at Tower Grove House this holiday season. The House is decorated in Victorian holiday splendor throughout December and open for tours 10 a.m. to 4 p.m.

Candlelight Tour

This year the Candlelight Tour is part of "Carols at the Garden," a spectacular festival of music on December 1. Please see the back cover of this Bulletin for details.

Holiday Tea

The Holiday Tea, sponsored by Tower Grove House Auxiliary, will be held Sunday afternoon, December 5, 1993, from 3 to 5 p.m. Visit the House for a Victorian Christmas tour, followed by refreshments in the Tea Room. Enter at 2345 Tower Grove Avenue, where your name will be registered. Parking is available in the parking lot across the street at the corner of Magnolia and Tower Grove. Reservations are $8 per person and must be received no later that November 25, 1993. Please use the form at right, or call 577-5150 for more information.

1993 Holiday Tea

Please make_____reservations for the Holiday Tea on December 5, 1993, 3 p.m. to 5 p.m. Enclosed is my check for $_____ at $8 per person, payable to Tower Grove House Auxiliary. Checks must be received no later than November 25, 1993.

Name_____

Address_____

City_____

State_____ Zip_____

Phone_____

Mail to: Tower Grove House Auxiliary
Missouri Botanical Garden
P. O. Box 299
St. Louis, Missouri 63166-0299

Holiday Luncheons

Special holiday luncheons will be served at 12 noon in the Tea Room at Tower Grove House on Tuesday, December 7; Thursday, December 9; Monday, December 13; and Wednesday, December 15. Reservations are required and will be accepted beginning Friday, November 12, at 9 a.m.; please call 577-5150 for reservations. Payment must be received no later than November 25, 1993.

In Memory of Virginia Blume

One of Henry Shaw's pieces of furniture, a beautifully carved rosewood dresser with a marble top and a massive mirror, has been refurbished and is back on display in Tower Grove House. The piece was restored in memory of Virginia Blume, a past president of the Tower Grove House Auxiliary.

Virginia Blume, a dedicated volunteer at Tower Grove House, died August 19, 1992. She began volunteering at the House in 1970 as a tour guide, and when the Tower Grove House Auxiliary was formed in January 1977, she became a charter member. Virginia served as president of the Auxiliary 1986-88, and again 1990-92. Her selfless service and dedication are deeply missed.

From the Garden Gate Shop

Holiday Preview Sale

Members save 20 percent!
Thursday, Nov. 4 -- 9 a.m. to 6:30 p.m.
Friday, Nov. 5 -- 9 a.m. to 6:30 p.m.
Saturday, Nov. 6 -- 9 a.m. to 5 p.m.

Celebrate a woodland holiday with birds, butterflies, and old world ornaments with a botanical theme. Give garden accessories for porch and patio, gardening books, cards and posters, plus the delightful 1993 Garden holiday card by local artist Ann Thompson and the 1994 Garden calendar with photographs by Jack Jennings. Refreshments will be served.

Holiday Plant & Gift Sale

Members save 20 percent!
Thursday, Dec. 9 -- 9 a.m. to 6:30 p.m.
Friday, Dec. 10 -- 9 a.m. to 6:30 p.m.
Saturday, Dec. 11 -- 9 a.m. to 5 p.m.

Holiday poinsettias, Christmas cactus, miniature decorated trees, Norfolk Island pines, seasonal blooming plants, indoor bulb kits with amaryllis and paperwhites, gift kits for children and adults, gardening tools, wind chimes, sundials, books, and gifts for everyone on your list. Refreshments will be served. Watch your mail for a special bonus offer!

Garden Books for Holiday Giving

The American Horticultural Society Encyclopedia of Gardening

A comprehensive, authoritative, and up-to-date gardening reference compiled by a team of 50 experts in two sections: "Creating the Garden" and "Maintaining the Garden." $59.95

The Ultimate Rose Book

Fifteen hundred roses -- antique, modern, miniature, and wild -- all shown in color photographs and selected for their beauty, fragrance, and enduring popularity. 1650 photographs. $49.50

The 1993 Garden holiday card by local artist Ann Thompson is printed in full color.

Plus -- A Distinguished New Book by a Garden Researcher

The Woody Iridaceae

by Peter Goldblatt, Ph.D.
Timber Press
145 pages, 13 color plates,
17 line drawings and tables.
$29.95, hardcover

The Iris family, Iridaceae, is familiar to most gardeners for its herbaceous species, *Iris, Crocus,* and *Gladiolus.* This beautifully illustrated book introduces three extraordinary genera of the family that are woody shrubs: *Nivenia, Klattia,* and *Witsenia.*

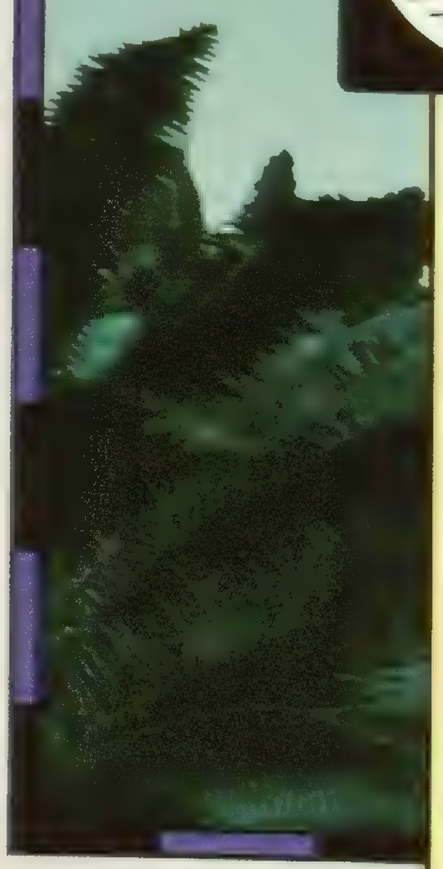
Dr. Peter Goldblatt, B.A. Krukoff Curator of African Botany at the Garden, is an expert on the Iridaceae. This book is the first thorough botanical investigation of this specialized group of genera, which includes just 13 species. This monograph provides a rigorous scientific account of these species, each illustrated with an exquisite full page watercolor done from life by noted botanical artist Fay Anderson.

Dr. Peter H. Raven said, "This beautiful book is a significant accomplishment and a welcome addition to botanical literature."

A GARDEN

Missouri Botanical Garden

"To discover and share knowledge about plants and their environment, in order to preserve and enrich life" — this is the mission of the Missouri Botanical Garden. Plants are the source of our food, of animal habitats, of medicines, fibers and industrial materials. Yet out of 250,000 species of flowering plants, 225,000 have never been evaluated for potential use, and today we are obliterating living species from our planet at a rate that far exceeds the extinction of the dinosaurs. If enough of our biological treasures are lost, we will deplete the genetic building blocks of the future and threaten the renewal and balance of life on Earth. Missouri Botanical Garden researchers discover and share the basic information crucial to understanding and preserving our genetic heritage.



The Search

Missouri Botanical Garden works to accumulate basic knowledge of the world's plants by:

- *Collecting plants in the field*
- *Cataloging dried herbarium specimens*
- *Computerizing information*
- *Publishing information in books and scientific journals*
- *Fostering collaboration among scientists and institutions*

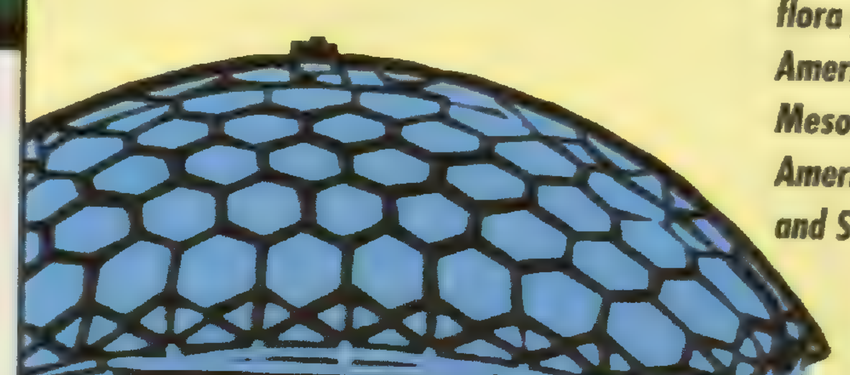
The Results

Today botanical information is more up to date and easily accessible with:

TROPICOS - This benchmark computer system, developed at the Garden, is the largest botanical database in the world, used by researchers in the field and by computer networks worldwide. TROPICOS is constantly being updated and makes it possible to synthesize information in useful new ways.

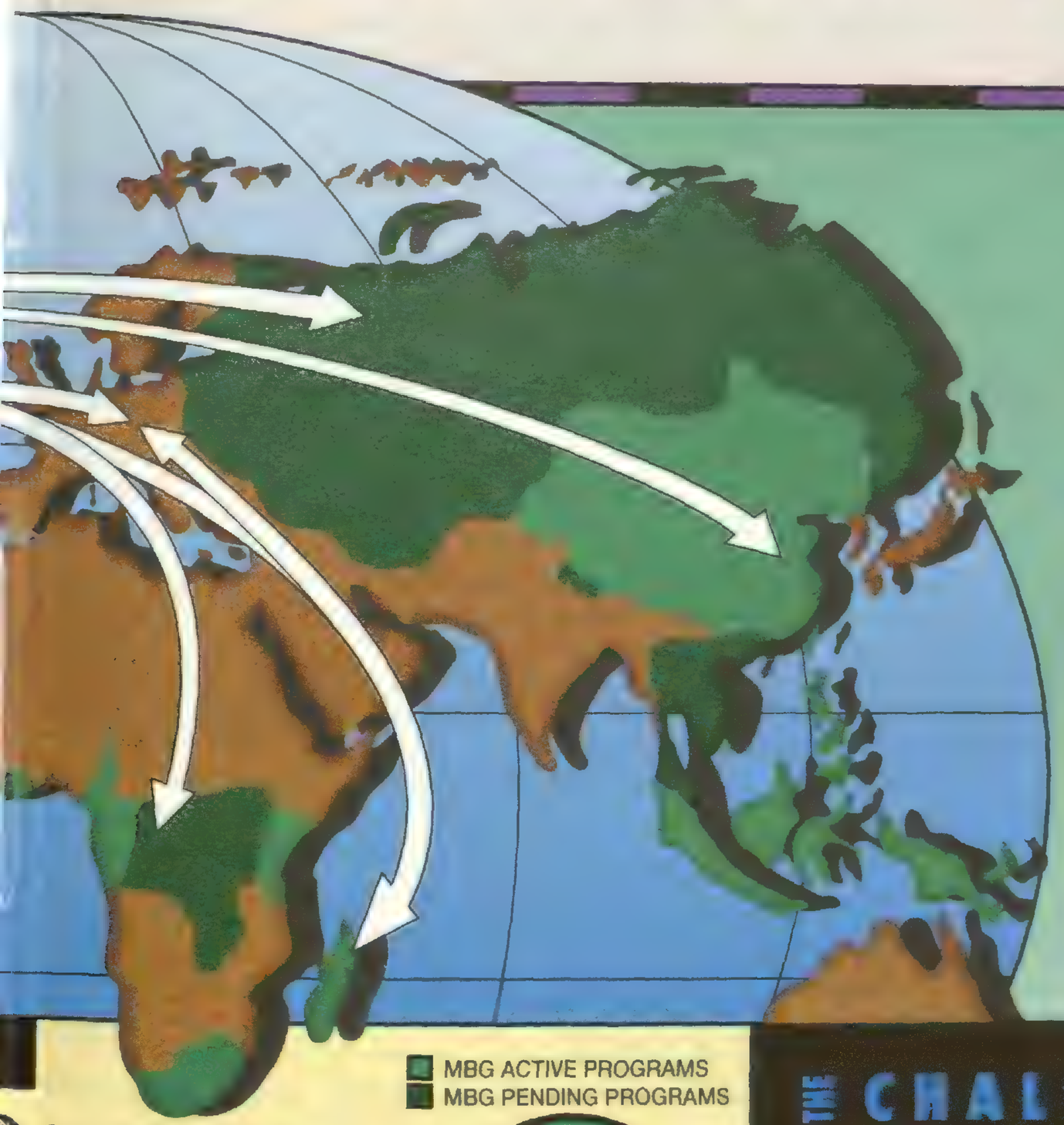
Floras - A flora is a publication that completely describes the plants of a geographical area. Missouri Botanical Garden sponsors and collaborates on flora projects for North America, China, Madagascar, Mesoamerica, much of South America, and parts of Africa and Southeast Asia.

The Uses



B I O D I V

FOR THE WORLD



MBG ACTIVE PROGRAMS
MBG PENDING PROGRAMS

- *Conservation organizations – The Garden is headquarters for the Center for Plant Conservation*
- *Pharmaceutical companies*
- *Land use managers and planners*
- *Agricultural researchers*
- *Educators and scientists*
- *NCI - The Garden works directly with the National Cancer Institute to find plants with potential for fighting cancer, AIDS, and other devastating diseases.*

And Beyond

The effects of the Garden's research

- *Assisting scientific research*
- *Educating botanists*
- *Building stronger institutions in nations with rich biological resources*
- *Encouraging international cooperation in science and conservation*
- *Creating respect for our global environment and the interdependence of all living things*

THE CHALLENGE

About two-thirds of all plant species are concentrated in the tropics, the most ecologically threatened regions on Earth. In the tropics, the demands of the global economy, widespread poverty, and the pressures of exploding human population are causing massive deforestation, leading to permanent, irreversible loss of plants, animals, and their genetic riches. Deforestation affects every country in the world, upsetting the fragile balance of our climate and depleting our natural resources. Missouri Botanical Garden has the world's largest program in tropical botany, racing against time to find and document species before they are lost forever.

Research can help us find ways to conserve our biological heritage. But the threat to our world is immediate and urgent. Human population is expected to double in the next 40 years. Currently 40 million acres of tropical forests are destroyed annually; at that rate they will soon be gone. Over one-fifth of all flowering plants, and countless living creatures that depend on them, may become extinct in the next few decades. Only worldwide international cooperation to support sustainable economic development will slow or halt the loss of Earth's natural resources. Missouri Botanical Garden is a leader in international scientific collaboration, an important first step toward preserving our world.

E R S I T Y

Members

Holiday Wreaths

December 1 through January 2
9 a.m. to 5 p.m. daily
Ridgway Center

Spectacular holiday wreaths created by some of the finest floral designers in the St. Louis area:

• Botanicals on the Park • Ladue Florist •
Cumberworth's Fine Flowers • Ken Miesner's Flowers
• Jon Prel Floral Design • Jody Delf •
• Randy Felkey Florals • Dale Rohman •
Hereford-Andrew Design • Bozzay Florists
• Designs of Distinction •
• Charles W. Freeman •

Thank You!
"Best of Missouri" Market Benefactors

Commerce Bank of St. Louis
Premier Homes Inc.

The Boatmen's National Bank of St. Louis

St. Louis County Farm Bureau
Missouri Soybean Merchandising Council

Century Bank
First Bank
Huntleigh / McGehee
Mr. and Mrs. John Bender

KIX 104
KTVI Channel 2

And Very Special Thanks To...

Nora Stern and Ellen Dubinsky, co-chairs of the "Best of Missouri" Market, and their committee of volunteers. Their hard work and enthusiasm made the "Best of Missouri" Market a tremendous success for the second year in a row.

Holiday Gift Membership Special — Save 20%

During the Holiday Plant & Gift Sale December 9, 10, and 11, you may purchase a $45 Garden membership for just $36, or a $40 senior membership for just $32, a savings of 20 percent!

Then enjoy the 20 percent members' discount in the Garden Gate Shop, or give a membership as a gift that will delight family and friends all year long. Each gift recipient will be sent a limited edition set of ten Missouri Botanical Garden note cards and a holiday greeting from you.

The caption of a photograph on page 18 of the September/October 1993 Bulletin spelled the name of Master Gardener Janet Racen incorrectly. We regret the error.

Shaw Arboretum Butterfly Count

by Arboretum staff members Scott Woodbury and James Trager
Total species: 30 Total individuals: 362

MARY ANN KRESSIG

THE TALLY IS IN from the first annual Shaw Arboretum butterfly count on Sunday, August 8, 1993. Butterfly enthusiasts, both new and experienced, were thrilled and awestruck at the sight of hundreds of swallowtails feeding on masses of ironweed, prairie blazing star, and butterfly milkweed. "So many we couldn't even count them" said Peggy Whitmire, benefactor of the Whitmire Wildflower Garden and volunteer butterfly counter.

The butterfly counters accompanied local experts Linda Elvis, Phil Kœnig, Suse Stark, and James Trager, who led tallying groups through the arboretum glades, experimental prairie, and Whitmire Wildflower Garden. Although fun for all participants, the butterfly count is a serious endeavor. While not a scientific census, the compilation of butterfly species and numbers contributes to better understanding of relative abundance, population fluctuations and local diversity.

The great diversity of butterflies is nowhere more evident than on swamp milkweed in the Whitmire Wildflower Garden. The zebra, parsley, spicebush, tiger, and giant swallowtails, as well as the great spangled fritillary, silver-spotted and sachem skippers, buckeye, and monarch were among the fluttering, feeding frenzy on two thriving specimens of this milkweed in the wildflower garden. Butterfly activity is welcome in the flower-filled garden as it is elsewhere on the Arboretum. It is evident not only in the colorful adults, but in the numerous leaf-chewing larvae and eggs present on paw-paw, milkweed, and golden alexander leaves. The Whitmire Wildflower Garden is a sanctuary for insects which, in more conventional gardens, are regarded as pests.

MARY ANN KRESSIG

James Trager (right) examines a butterfly with (from left) Christine Terlina, Gary Schimmelpfenig and Nancy Gugenheim.

Above, left: All butterflies were released unharmed.

CELEBRATION OF A LIFE *Edgar W. Denison*

ON SEPTEMBER 11, friends and family of the late Edgar Denison gathered at Shaw Arboretum to pay tribute to the life of one of the Garden's greatest friends. Mr. Denison died August 14, at age 88.

Mr. Denison, an expert amateur botanist and naturalist, was the author and illustrator of the standard field guide *Missouri Wildflowers*. Now in its fourth edition, the book has sold over 85,000 copies since it was published in 1962.

Mr. Denison came to the United States from his native Germany and lived in Kirkwood for 56 years. He was a cost engineer for Union Electric before retiring in 1969. His extraordinary range of enthusiasms included his magnificent wildflower garden, with more than 1,000 varieties of plants all grown from seed; lecturing and teaching on botany, conservation, and gardening; music, painting, photography, and woodworking; active work with the Missouri Native Plant Society and the Webster Groves Nature Study Society, among many others; and a long involvement with the Garden and Shaw Arboretum.

Mr. Denison with one of his wildflower paintings

Several friends and family members shared their memories of Mr. Denison at the Arboretum gathering. Kathy Love, editor for the Missouri Department of Conservation, said, "He was a courtly, old-world gentleman with a wry sense of humor and a stubborn streak as wide as a mighty oak....Edgar Denison leaves a legacy of knowledge to thousands of people he will never meet. To those of us fortunate to have known him, he left even more. But his instructions are strict — take care of the seeds, make them grow."

Dr. George Yatskievych of the Missouri Department of Conservation and curator of Missouri Plants at the Garden portrayed Mr. Denison's unique sense of humor. "One Christmas we got a card from him with one of his hand-colored illustrations on the front, and the inside simply said, "Merry Christmas. Can you tell what plant this is?"

Dr. Peter H. Raven, director of the Garden, related that the Edgar Denison Fund for the Study of Missouri Plants was established through tribute gifts received in honor of Denison's 80th birthday and has supported students through the years doing botanical field work in Missouri. Mr. Denison gave his collection of 1,800 slides of Missouri wildflowers and a set of 34 of his watercolors to the Garden, where they will be maintained permanently. In addition to his celebrated wildflower tours at the Arboretum, Mr. Denison also translated the correspondence of George Engelmann, the botanical pioneer who was Henry Shaw's scientific advisor. This was a prodigious feat requiring the rare ability to read *fraktur*, the 19th century German black-letter script.

In conclusion, Dr. Raven said, "In the glades and prairies and woods of Missouri, Edgar Denison will always be alive with us — teaching, urging, challenging us to continue to do everything possible to enjoy, to cherish, and to preserve the wild things that make this such a wonderful place to live."

The **Partnership** *Campaign*

The Partnership Campaign was launched in 1993 to raise $29.5 million from corporate and private philanthropic sources to support major capital improvements at the Garden. This effort is different in scope and purpose from the Proposition E tax campaign featured on pages 3-5 of this issue. Proposition E primarily will provide continuous, ongoing program support and facilities for the services St. Louisans expect from the Garden; the major goals of the Partnership Campaign are new research facilities and the demonstration gardens at the Kemper Center for Home Gardening.

The Case for Action

Since its founding in 1859, the Garden has become one of the world's leading centers in the study of plant biological diversity. Today it plays a preeminent role in botanical research and environmental education. Both of these areas are of crucial importance for the future. The Garden has reached its present stature because year after year, generation after generation, it has repaid the support of the people of St. Louis with a high level of performance.

Twenty years ago, the Garden attracted 256,652 visitors, had 4,000 members, and served about 20,000 people through educational activities and tours. Today, annual attendance surpasses 850,000; membership exceeds 30,000 families; and more than 112,000 children and adults participate in educational programs. The operating budget, which totaled $920,000 in 1973, grew to $16.7 million in fiscal 1992, and was once again balanced.

The partnership of the citizens of St. Louis with the Garden has fueled a steady growth in education and outreach. With the three-year Partnership Campaign, the Garden seeks the support to continue making its vital and unique contribution to the St. Louis region, the United States, and the world.

The Center for Plant Biodiversity

The primary component of the Partnership Campaign is a new research headquarters to house the Garden's Center for Plant Biodiversity, including the scientific staff, herbarium, library, computerized databases, and graduate students. The Center brings together the Garden's own broad research agenda with those of other institutions and organizations to concentrate on basic and applied research and conservation efforts worldwide.

The Research Division, which had five scientists on staff in 1973, now numbers more than 50 men and women with doctoral degrees, 83 support personnel, a number of postdoctoral fellows, and 41 volunteers. The growth of the research program has brought the Garden to the verge of a facilities crisis.

An analysis projects that by the year 2010 the Research Division will need 85,000 square feet of additional space. There is no practical location on the Garden grounds to build a new structure of this size, making it necessary to plan for a site nearby. This building, which will be erected near the Garden at the corner of Vandeventer and Shaw Avenues, will be a showcase for environmentally sound architecture and engineering (see "Building Green" on page 17).

Renovation of the Lehmann Building

Moving a substantial portion of the Research Division to a new building will allow the Garden to utilize the John S. Lehmann for administrative purposes. The Director's Office will remain there, as will some research functions, and the building will be extensively renovated for use by the Membership and Development Office, realizing a long-cherished dream to create a Members' Room for reading, meetings, and contemplation.

Demonstration Gardens at the Center for Home Gardening

The William T. Kemper Center for Home Gardening, dedicated in June, 1991, was the first step in an ambitious plan to meet steadily expanding demands for gardening information and community-oriented services. The next step is construction of a series of 23 residentially-scaled outdoor gardens that illustrate the extraordinary range of possibilities that are available to home gardeners in construction materials, landscaping, design, plants and their care. Recent issues of the Bulletin have highlighted some of these gardens, and a description of the Bird Garden appears on page 9.

Chinese Botanical Specimens

As the U.S. coordinating center for the Flora of China, a joint Chinese-American project to produce a concise English language account of all the plants in China over the next 12 years, the Garden is in a unique position to acquire a significant number of valuable herbarium specimens from Chinese botanical institutions. The project has considerable long-term value. Six thousand Chinese plant species are used actively as sources of medicine, and thousands more have economic value. This is the first time since the 1930s that major numbers of Chinese plant specimens have been made available to Western scientists. This collection makes the Garden into one of the world's major centers for study of Chinese plants.

Shaw Arboretum Visitor Center — Phase One

The Shaw Arboretum in Gray Summit, Missouri, forty miles west of St. Louis, has long been a popular place for visitors to appreciate the natural beauty of the Ozark region. Steadily increasing attendance and demand for environmentally focused education programs mandated a Master Plan for the Arboreutum, approved by the Board of Trustees in 1990, that calls for development of a number of features over time, including a Visitor Center Complex.

The first phase entails renovation and expansion of the Manor House, a charming brick structure completed in 1879. The Manor House will contain interpretive displays and visitor facilities. The Garden has received a $300,000 matching grant from the Missouri Department of Conservation to support the displays and must raise support for the construction portion of the project by June, 1995.

continued on next page

WHEN the Garden addressed the necessity of larger facilities for its research program, it was clear from the start that our new Center for Plant Biodiversity would be more than just a building. It would be an international center for the exchange of ideas both scholarly and practical, a focal point for promoting understanding and awareness of environmental issues that threaten our planet.

It became imperative that the new facility embody environmental principles in its design and operation. With that mandate in mind, the Garden has assembled a team of distinguished architects who are deeply committed to achieving our goal.

The team is headed by the Christner Partnership, Inc., in association with Louis R. Saur & Associates, Inc., both St. Louis-based architectural firms. The Christner Partnership were the architects and planners for the renovation of the Climatron® complex and construction of the Shoenberg Temperate House, while Saur & Associates handled the Kemper Center for Home Gardening. The St. Louis firms will collaborate with a team that includes Environmental Planning and Design of Pittsburgh, who develop and oversee the Garden's Master Plan, and the Croxton Collaborative of New York, the firm that has achieved national prominence in environmental design with its landmark projects for the National Audubon Society Headquarters and the National Resource Defense Council.

"The amount of preliminary research on a project like this is much greater than for a conventional building," said Theodore C. Christner. "So-called 'sustainable' architecture requires creating a building that is energy efficient, that makes a low impact on natural resources both in the materials used for construction and in the systems required to operate the building. Upfront costs for some systems must be weighed against potential energy savings. This requires involving the systems engineers early in the design process, to study and integrate all aspects of the building for maximum efficiency. We are still learning how to study these kinds of issues."

It is estimated that the energy needed to create and maintain buildings and infrastructure in the United States represents over 50% of our primary energy consumption each year. There is growing awareness that it is imperative to improve in this area to ensure the strength of our national economy. There is also a growing appreciation of the value added to a building by increased worker health and productivity that flows from better indoor air quality, use of natural lighting, and elimination of materials that result in "sick building syndrome."

Randolph R. Croxton is a pioneer in studying and incorporating these concerns in his buildings. For instance, selecting wood from a sustainable source can have a significant impact on future sources of supply; using floor tiles made from recycled glass or carpeting made from natural fibers encourages manufacturers to make these kinds of products. Adding skylights saves on artificial lighting; waste water run-off can be collected to irrigate landscape plantings, which in turn provide shade and help insulate the building. Using energy efficient lighting and cooling systems can yield significant benefits: in the National Audubon Society headquarters in New York City, the Croxton Collaborative confirmed a significant improvement in energy efficiency over average buildings, while improving air and lighting quality.

In addition to its plans for the new research facility, the Garden is fostering environmentally sound building practices here in St. Louis with its support of the Earthways/Green Builders Council, a consortium of local architects, builders, remodelers, and building suppliers who are promoting use of environmental awareness in construction materials and techniques.

"Building GREEN"

Architecture for the Future

Shown meeting at the Garden are (seated, from left): Lou Saur; Peter Raven; David Greusel of the Christner Partnership. Standing, from left: Randy Croxton, Ted Christner, Paul Brockmann, director of general services ant the Garden; Marshall Crosby, senior botanist.

The planning process for the Garden's Center for Plant Biodiversity is still in its preliminary stages, but the opportunities are exciting. As Randy Croxton observes, "High quality buildings reward us with long term economic and environmental savings for the owner, the municipality, and for the country as a whole....This is a golden opportunity for change."

PARTNERSHIP CAMPAIGN continued

the new Climatron Complex in 1990. A generous award of $731,000 from the National Science Foundation has made it possible to prepare exhibits that will be installed in 1995, but additional support is needed to complete these educational displays on habitats, global energy systems, ecological principals, and deforestation.

Other Capital Needs

In addition, the Partnership Campaign seeks support for enhancements to the English Woodland Garden, the Emerson Electric Co. Conservation Center, and other facilities.

Over and above the $29.5 million goal of the Partnership Campaign, the Garden is also seeking to meet $3.5 million in urgent needs. These include renovation of the 1849 Administration Building; construction of two major horticultural displays adjacent to the Kemper Center, a Boxwood Garden and a Chinese Garden; and much-needed work on many of the Garden's historic buildings.

40th Annual Systematics Symposium

"Trends in Economic Botany"

450 SCIENTISTS from the United States and other countries attended the Missouri Botanical Garden's 40th annual Systematics Symposium, "Economic Botany," which was held here on October 8 and 9, 1993.

The rapacious resource consumption of the world's 5.4 billion people has led to unprecedented environmental destruction and massive loss of biodiversity. Among other issues, symposium participants discussed ways that botanists can work with others to improve the world's environmental situation.

"The symposium covered a mixture of everything from plants found in archaeological digs to cutting-edge research on the AIDS virus," said Dr. P. Mick Richardson, manager of graduate studies and organizer of the symposium. "We tried to cover as many different aspects of economic botany as we could."

Topics included how ancient Indians used plants, how native people of Peru utilize the flora, how we can look for cures for modern diseases in plants, and what industry can do with crops to make them more useful. Participants pondered such questions as "How can we learn from the past?" and "How can we wisely use forest resources?"

The keynote speaker Saturday evening was the well-known economic botanist Charles Heiser, who spoke about the career of Edgar Anderson, a legendary botanist and curator of useful plants who served as the Garden's director from 1954 to 1957.

For the past 40 years and with almost continuous support from the National Science Foundation, the Systematics Symposium at the Garden has been providing a forum for the exchange of information and ideas on important trends in systematic botany.

CLIFF WILLIS

Speakers at the symposium were (back row, from left): W. Hardy Eshbaugh, Charles Heiser, P. Mick Richardson, Robert Fraley, Gayle Fritz. Front row, from left: Beryl Simpson, Janis Alcorn, Gordon Cragg, Jan Salick. Not pictured: Walter Lewis.

Garden Hosts First International Conference on the Rubiaceae

OCTOBER 4–6, 1993, the Garden hosted approximately 50 botanists from 14 countries for the first scientific conference devoted to the systematics of the Rubiaceae, or coffee family. The conference was dedicated to Dr. John Dwyer, a specialist in Rubiaceae on the Garden's research staff for more than 30 years.

The Rubiaceae is the world's fourth largest family of angiosperms, or flowering plants, with about 10,000 species. Its classification is complex, and many issues are far from resolved. Recent systematic research in the family considers new evidence from DNA, cytology, and anatomy. Participants presented results from ongoing research, using the classification system proposed by Dr. Elmar Robbrecht of Belgium for the woody taxa as a starting point for discussing current work and priorities for research in this important family.

The Rubiaceae includes many well known members, including coffee, quinine, and gardenias. It forms the dominant midstory component of most Neotropical forests and is a major component of Old World tropics as well. Dr. Charlotte M. Taylor, Dr. P. Mick Richardson, and Carol Davit of the Garden served as coordinators for the conference.

Below: Participants in the 1993 Rubiaceae conference

RICHARD BENKOF

RICHARD BENKOF

***VISITORS FROM PERU** -- Visitors from the Universidad Nacional de Trujillo in Peru visited the Garden this fall to discuss potential research collaboration. From left: James S. Miller and Rudolfo Vasquez, MBG; Alvaro Tresierra, dean of biological sciences at Trujillo; Jorge Ruiz Dávila, rector of the University at Trujillo; and John J. Pipoly III, MBG.*

RICHARD BENKOF

***MARGARET THATCHER VISITS THE GARDEN** -- In September the Garden welcomed Margaret, The Lady Thatcher, former prime minister of Great Britain. Lady Thatcher is shown with Dr. Peter H. Raven, who hosted her informal tour of the Garden.*

CLIFF WILLIS

***VISITORS FROM DENMARK** -- Kai Larsen of the Department of Systematic Botany, Biological Institute of Aarhus, Denmark, visited the Garden recently to lecture and meet with Garden research staff. Shown with Prof. Larsen are, from left: Supee Larsen; Carmen Ulloa, MBG; and Peter Jørgensen, MBG, who was a student of Prof. Larsen in Denmark.*

***VISITING FROM TAIWAN** -- Chang-Hung Chou, director of the Institute of Botany, Academia Sinica, Taipei, Taiwan, visited the Garden in September. Dr. Chou (center) is a member of the editorial board for the Flora of China project. He is shown here with Garden botanists James L. Zarucchi (left) and Ihsan Al-Shehbaz.*

RICHARD BENKOF

***DALAI LAMA VISITS** -- In September, His Holiness the Dalai Lama visited the Garden and was welcomed with an informal tour of the grounds and the Climatron.*

GRADUATE STUDENTS NEWS **Two New Ph.D.'s**

CLIFF WILLIS

Oliver Phillips and Ricardo Rueda

THIS summer two graduate students in the Garden's program in systematic botany earned their doctoral degrees.

Oliver Phillips of England came to Washington University in 1988, studying ethnobotany under the late Garden curator Alwyn H. Gentry. Phillips was awarded a dissertation research grant from the National Science Foundation for his field work in Peru, which led to his dissertation "Comparative Valuation of Tropical Forests in Amazonian Peru." This groundbreaking study established for the first time techniques for estimating the potential and actual usefulness of forest plants to humans. Phillips is working as a postdoctoral researcher for the Center for Plant Conservation, supported by the Surdna Foundation, on a computer analysis of the economic usefulness of threatened and endangered plants of the United States.

Ricardo Rueda came to the Garden on a leave of absence from the faculty of the Universidad Nacional Autónoma de Nicaragua-León. He earned his M.S. and Ph.D. degrees in plant systematics from the University of Missouri-St. Louis, working under the late Alwyn Gentry. Rueda won the Raju Mehra Award for best foreign student in 1991 and was named the first Peter H. Raven Fellow by UMSL. He was awarded a dissertation research grant by NSF for "Systematics and Evolution of the Genus *Petrea* (Verbenaceae)". Rueda is the first Nicaraguan botanist to earn his doctorate in the U.S.

TRUSTEE PROFILE *Eddie G. Davis*

AT THE JULY 13, 1993, meeting of the St. Louis Board of Education, Eddie G. Davis was elected president of the Board. By virtue of his office, Mr. Davis became a member of the Garden's Board of Trustees, as specified in Henry Shaw's Will. Mr. Davis succeeds the Rev. Earl E. Nance, Jr. as president of the Board of Education.

Mr. Davis is supervisor of Community Relations for Union Electric Company, where he has been employed for 22 years. He served as a member of the St. Louis Board of Education from 1987 to 1989 and was elected to a six-year term on April 2, 1991.

Mr. Davis earned his bachelor's degree in business administration and finance from St. Louis University in 1976. He is active in many community service organizations, serving as a member of the Board of Directors of Downtown St. Louis, Inc.; chairman of the Tax Increment Finance Commission, City of St. Louis; chairman of the Educational Committee, Westlake Scholarship Foundation; president of the Fairfax Court Neighbors Association; vice president of the Board of Directors, Portfolio; secretary to the Board of Directors of the "Sold On St. Louis" campaign, St. Louis Regional Commerce and Growth Association; former president of the Board of Directors, The Youth and Family Center; and a member of the Advisory Council of St. Louis Public Schools Career Education Division.

"The advancement of science education is critical for the United States," Mr. Davis said. "I am thrilled to be able to work with the Garden, which is playing such an important role in strengthening science education here in St. Louis."

Dr. Peter H. Raven, director, said, "We are delighted to welcome Mr. Davis to the Board of Trustees and to continuing the Garden's ongoing relationship with the St. Louis Board of Education. We are also deeply grateful the Rev. Earl Nance for his invaluable contributions to the Garden."

Crosby Celebrates 25 Years at the Garden

ON SEPTEMBER 28, 1993, the staff honored Dr. Marshall R. Crosby, senior botanist and senior advisor to the director, for his 25 years on the staff of the Garden with a reception for staff and friends in the John S. Lehmann Building.

Dr. Crosby came to the Garden from Duke University, where he earned both his B.S. and Ph.D. degrees. From the beginning of his career he was interested in the taxonomy of mosses, and thanks to him the Garden today is a world center for bryology. Crosby has guided the Garden's scientific publications since 1969, serving as editor of the *Annals*, and as founder of *Monographs in Systematic Botany*, *MO* (the Research Division's internal newsletter), *Herbarium News*, and *NOVON*. In addition, he was instrumental in developing TROPICOS, the Garden's computer database for botanical research.

Dr. Peter H. Raven, director, said, "Everything Marshall does is done with great distinction and attention to design and style. He has always helped to make sure that we maintain the quality and integrity of the Garden."

Above: Marshall Crosby (center) cuts his anniversary cake with assistance from Olga-Martha Monteil and Peter H. Raven.

GIFT PLANNING

A Silver Lining

DESPITE the fact that the recent tax law changes represent an increase for some tax brackets, there is still good news to be found. The "silver lining" for those who are affected is that gifts to the Garden are a very attractive way to meet the new tax burdens, and at the same time help achieve charitable goals. With higher taxes, the deduction for a charitable gift is correspondingly more valuable. There is also good news in the 1993 Tax Act with respect to appreciated property. All appreciated property, including stocks and tangible personal property, is now deductible at fair market value and is no longer a preference for the Alternative Minimum Tax.

Many of you are familiar with the Garden's mission statement, "To discover and share knowledge about plants and their environment, in order to preserve and enrich life". That statement drives the Garden's response to requests for science education, for teacher training programs, for information on our environment, and for home gardening resources. Additional support is critical to meet these challenges. The "silver lining" has produced a win-win situation: an increased contribution to the Garden creates an important tax advantage for the donor, and it will provide crucially needed funds to further the Garden's mission. If you would like more information on charitable gift planning, please call the Development Office at 577-9532.

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A New St. Louis Holiday Tradition for the Entire Family!

Carols in the Garden

A Winter Night's Festival

featuring the

Tower Grove House Candlelight Tour

Wednesday, December 1, 1993 • 4 to 9 p.m.

House Tours: 4:30 to 7:30 p.m.

Enter at the Ridgway Center
Garden Gate Shop will be open

The sounds of holiday music fill the air as carolers roam the Garden and revelers make their way along candlelit paths to Tower Grove House, where they are welcomed by Henry Shaw. Within, Shaw's historic home is decorated in all its finery for a real Victorian Christmas tour, lighted with candles and warmed with holiday cheer. At Spink Pavilion Santa Claus greets young visitors with goodies and treats, while the tram circles the Garden grounds. Start your holidays with music and merriment!

Admission toTower Grove House Tour and Festival:
$10 for members, seniors, and children 12 and under; $12.50 for non-members.
Festival Admission Only: $4 for members and seniors; $2.50 for children 12 and under; $6 for non-members.

Admission is by paid reservation or pre-event ticket purchase only.
Tickets available at the Ridgway Center Ticket Counter beginning November 1.
Call (314)577-5125 for reservations.

A SPECIAL HOLIDAY EVENT

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BULLETIN

Missouri Botanical Garden

JANUARY/
FEBRUARY
1994

VOLUME LXXXII
NUMBER ONE

Comment

MISSOURI BOTANICAL GARDEN MISSION: "TO DISCOVER AND SHARE KNOWLEDGE ABOUT PLANTS AND THEIR ENVIRONMENT, IN ORDER TO PRESERVE AND ENRICH LIFE."

On behalf of the Garden Board and staff I wish to thank you for your support of our recent tax campaign. Regretfully, the voters did not feel the time was right for additional support. The Garden has begun looking at its many priorities and existing programs to determine how it can meet the additional public demands placed upon it over the next several years.

There are difficult decisions to make. The Garden sought funding in response to a growing public demand for more services, a growing need for more and better science and environmental education programs, and increased interaction with the community. We are now faced with the clear challenge to do a better job of explaining why the Garden deserves additional support. We look on the experience as a means of enrichment and renewal because it encourages us to find new solutions to meet our needs and serve the community.

While the results of the campaign were far from what we had hoped, it yielded some substantial benefits. The Reverend Earl Nance Jr., who served as treasurer and our most eloquent spokesman, provided untiring leadership and motivation. The campaign successfully increased awareness throughout St. Louis of the Garden's research and education programs and, we hope, the Garden's mission.

In addition, we were pleased with the strong support for Proposition E from our neighbors and our elected officials, including Alderman Steve Conway, Representative Pat Dougherty, and Senator William Clay Jr. Endorsements from the St. Louis Labor Council AFL-CIO, from local and regional environmental and education organizations, and from many individuals and groups in the African-American community were great assets in explaining our needs to the community.

As we look toward a new year, the Partnership Campaign, the Garden's capital fund drive, will be a primary focus. (Please see the story on the following page.) And I am delighted to note that the Kingshighway overpass will be reopening soon after a two-year reconstruction, enabling you to reach the Garden easily once again.

Please accept my thanks for your continued support of the Garden and I hope that you will enjoy our activities, events, and programs in 1994.

— Peter H. Raven, Director

MISSOURI BOTANICAL
JUN 30 1994
GARDEN LIBRARY

New Pathways in English Woodland Garden

CLIFF WILLIS

ENGLISH WOODLAND GARDEN IMPROVEMENTS -- As part of the current Partnership Campaign, work is underway to expand and enhance the English Woodland Garden. The improvements include construction (shown above) of paved pathways, which will make it possible for visitors in wheelchairs to move freely through the area. The English Woodland Garden has been supported in part for many years by family and friends in memory of Adelaide La Beaume Cherbonnier and Edward Cherbonnier.

Moving?
Please remember to send us your new address.
To avoid missing any of your membership mailings, we need notification of your new address at least three weeks before you move. Please enclose the mailing label on the back cover of this *Bulletin* and mail to:

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On the Cover

Frost creates a garden full of flowers on the windows of the Linnean House.

Photo by Cliff Willis

Editor
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The **Partnership** *Campaign*

ON Sunday, October 17, 1993, the Board of Trustees hosted a brunch at the Garden to introduce publicly the Partnership Campaign, a $29.5 million capital fund drive. Trustee Andrew C. Taylor, chairman of the steering committee, announced that the Campaign already has received gifts and pledges totalling $11,892,000, or 40 percent of the goal.

The Partnership Campaign is based on a detailed analysis of the needs, costs, and potential challenges that the Garden will face over the next ten years. The primary component of the campaign is a new research building to house central activities of the Garden's Center for Plant Biodiversity, a designation that recognizes the range and scope of the Garden's present research agenda. The Center for Plant Biodiversity brings together the Garden's own broad range of resources with those of other institutions around the world to concentrate on basic and applied research and conservation efforts. The new research facility will provide urgently needed space for core scientific activities, the herbarium, the library, the computerized databases, and botanical training programs. Since a sufficiently large building would crowd the available space on the Garden's grounds, the new facility will be built nearby at the corner of Shaw and Vandeventer. The plan has met with enthusiastic approval from neighborhood residents and merchants.

The Partnership Campaign also seeks funding for a number of major goals, including construction of the 23 outdoor demonstration gardens that will complete the William T. Kemper Center for Home Gardening; acquisition of a rare and important collection of Chinese herbarium specimens; upgrading access to the library collection through an integrated on-line system; expanding and enhancing the English Woodland Garden; completion of the Emerson Electric Co. Conservation Center; renovation of the Manor House at the Shaw Arboretum; completion of exhibits for the Brookings Interpretive Center; and renovation of the John S. Lehmann Building after dedication of the new research facility. Further support is sought for renovation of the historic Administration Building and for construction of a Boxwood Garden and a Chinese Garden.

Speakers at the brunch on October 17 included The Honorable Richard A. Gephardt of St. Louis, majority leader of the United States House of Representatives; Ms. Catherine Moore, representing Senator Christopher S. Bond of Missouri; and The Honorable Bruce E. Babbitt, United States Secretary of the Interior, who delivered the keynote address.

continued on next page

TIM PARKER

Above: Bruce E. Babbitt, United States Secretary of the Interior (left) with Dr. Peter H. Raven and Andrew C. Taylor. Secretary Babbitt is holding the first two volumes of the* Flora of North America, *which were presented to him at the luncheon. Left: St. Louisan Yogi Berra was an honored guest. Below: John K. Wallace Jr. presented Congressman Richard A. Gephardt with a framed herbarium specimen.

TIM PARKER

TIM PARKER

An Address by The Honorable Bruce E. Babbitt, United States Secretary of the Interior

I DISCOVERED the Missouri Botanical Garden, not in Arizona, not in California, but in Brazil, where in the course of some work across the years I began to learn of an extraordinary band of people — Al Gentry, Peter Raven, and others who revealed to me, through their work, a brand new world of biodiversity and tropical ecology. They demonstrated an extraordinary fact: that this organization is known throughout the world as a leader in issues of tropical biodiversity.

I would like to suggest today that, with the commitment you have demonstrated to the growth and expansion of this institution, I believe you are on the threshold of an entirely new era, in which the Missouri Botanical Garden is in the process of becoming, to St. Louis and to Missouri, what the Kennedy Space Center is to Florida, what the Los Alamos National Laboratory is to New Mexico, and indeed, what the Silicon Valley is to California. Now I recognize that those are pretty extravagant comparisons, and I'd like to just briefly tell you why I think those comparisons are warranted, and why it is that this institution — with such deep roots and such extraordinary scholarship — is now gearing up to meet an entirely new and expanded world role.

The Garden is on the threshold of becoming to St. Louis what the Kennedy Space Center is to Florida.

The first reason is that we are now standing on the threshold of an entirely new relationship between our activity on the land and the natural world around us. For so many years, from the French explorations of the Mississippi River Valley to the Westward Expansion by the American pioneers, America seemed to be a land of infinite space and infinite productivity, a landscape that could scarcely be touched, much less harmed in any way. As we began to settle the nation and finally reached the Pacific, we began to think a little bit about the meaning of our natural environment, but our first response was simply to say, "There's plenty of space. We'll create a few parks and that will be adequate to establish and preserve our relationship with the natural world. The National Park Service, a few rangers, some fences around a couple of thousand acres here and a couple of thousand acres there, will be sufficient to demonstrate our commitment to a harmonious relationship."

But what we're learning now is that there isn't enough empty space anymore. The empty spaces are filling up and you can't keep nature fenced off on the back forty, because everything relates to everything else. The summer floods on the Mississippi and Missouri remind us that land use practices, wetlands practices, flood control practices a thousand miles upstream have dramatic consequences for everyone in the river basin. The crisis in the Pacific Northwest about the spotted owl and timber cuts really demonstrated to a lot of people in the West that we must examine entire systems, that everything happening in the Cascade ecosystem is relevant, and that it's impossible to fence off a tract of land — because fish and birds and pollution and copper smelter smoke and carbon dioxide don't respect those boundaries. The salmon in the Pacific Northwest originates in places as far away as the mountains of Idaho. This fish, in its life span, swims down the Snake, out the Columbia, circles off the shores of Japan, swimming through 23 political jurisdictions — each one with the power of life and death over this species of fish.

So, we are driven now to understand that we must begin to understand all of the relationships. We can't take ourselves apart from ecosystems. We live in them and everything is our concern, from the farthest mountaintop to the farthest reaches of the Mississippi and Missouri to what goes on right in our back yard. The wetlands legislation, the Endangered Species Act, many other pieces of federal legislation, are simply statements that we can't build fences. We can't say that we're here, nature's there. We have filled up the empty spaces.

It's now our responsibility to manage nature and to learn, all of us, to live a little more lightly on the land and with a little more respect for our surroundings. It's our responsibility to undertake a large and important process of mapping the ecosystems in which we live, inventorying all of the component parts and gathering that information up in a way that will help us make thoughtful decisions — not about whether to grow, but how to grow and where to grow and how to live in that kind of harmony.

The research and the material being produced by the Missouri Botanical Garden provides the beginnings (perhaps the most important single beginning) of a large national effort to take these inventories and to use them to map our surroundings as the Geological Survey did 100 years ago, so that we'll have the information and the advance warning on where the problems are. This will give us the space and the flexibility to accommodate development, rather than thoughtlessly running up against problems at the eleventh hour which then create a crisis, whether it's a spotted owl in the Northwest, the salmon runs, or whatever else.

The second reason I would suggest that your institution, the Missouri Botanical Garden, has such an extraordinary future, is because of the dawning awareness of the economic uses of biology and botany and biotechnology. If you look at the remnants of the meal at your table, you might remind yourself that every single thing we consumed at this lunch is ultimately derived from some kind of plant created through photosynthesis from the sun.

Our ability to sustain this banquet of human life depends on our ability to use biotechnology to improve strains of commodities, or to deal with organic systems in ways that can eliminate or at least modify our use of pesticides, or in a thousand other ways. The research

continued on next page

Flora Mesoamericana Is Published

MESOAMERICA -- the region including southern Mexico and the Central American countries from Guatemala and Belize to Panama -- has a flora that is remarkably rich and diverse. It includes dry forests, alpine areas and grasslands, as well as rain forests. Like much of the tropics, the plants of this region have been relatively unknown scientifically, compared to, for instance, the flora of North America or Europe. Thanks to an ambitious collaborative effort on the part of the Garden, the National Autonomous University of Mexico (UNAM), the Natural History Museum in London, and many cooperating specialists throughout the world, much more is now becoming known about Mesoamerica's extraordinary flora.

The first volume of *Flora Mesoamericana* will be published by UNAM in Mexico in early 1994. Published in Spanish so that it will be of greatest use to the people who live in the region, *Flora Mesoamericana* describes, for the first time, all the vascular plants growing from southern Mexico to Panama.

It represents the first major regional flora ever written in Spanish. Volume 6, which covers about 40 percent of monocots, including Poaceae, the grass family, is the first of the seven volumes to be published.

Work on the project began in 1981. Since then, botanists have been collecting plants intensively, studying them in herbaria around the region and busily writing and editing. Gerrit Davidse, the Garden's John S. Lehmann Curator of Grasses, has spent the majority of his research time on *Flora Mesoamericana* since the first organizational meetings in 1980. He coordinates the U.S. effort on the project, which has received its primary funding from the National Science Foundation.

During the course of the research, many interesting botanical discoveries were made. The most fantastic discovery involved a tiny threadlike plant from southern Mexico which turned out to be absolutely unique among the quarter million plant species known to science. Named *Lacadonia schismatica* and classified in its own family, it is the only plant ever discovered in which the orientation of the sex organs is reversed; the stamen arises within several rings of pistils. To make an already bizarre story even more intriguing, Mexican botanist Márquez-Guzmán and colleagues reported in a recent issue of *Annals of the Missouri Botanical Garden* that pollination occurs before the flowers open.

Ticodendraceae, a family consisting only of the single species of the genus *Ticodendron*, a tree with alder-like leaves, was discovered and described during the course of the *Flora Mesoamericana* research. It has been found in several locations in the region. *Haptanthus*, found only once in Honduras and published as a genus but not yet as a family, is another completely distinct group of plants, awaiting only the discovery of further material for it to be described as a family.

These sensational discoveries are unprecedented for any Flora in the world.

During their botanical investigations, scientists identified a new genus and species of tree, *Ruptiliocarpon caracolito*, in Costa Rica in a plant family that was previously thought to contain just one genus and species from Africa. The discovery of the relationship between these two groups of plants has led Garden scientists and associates to conclude that they both have descended from an ancestor that was probably present in both Africa and South America when the two continents were much closer together, between 100 and 50 million years ago.

"These discoveries are absolutely sensational botanically and unprecedented for any Flora in the world," said Dr. Peter H. Raven, director of the Garden. "This project represents a major commitment on the part of the three institutions to studying plants in a region of the world that is very poorly understood. We are very pleased to be a part of it."

Researchers estimate that 18,000 plant species occur in the 800,000 square kilometer region. All data collected will be included in the Garden's botanical database, TROPICOS, as well as the published volumes. The Flora will provide scientific and common names, technical botanical descriptions, distributions, taxonomic notes and identification keys. ■

BABBITT continued from page 4

being done here translates into agricultural success, into success in health care and pharmaceuticals. Twenty-five percent of the prescription drugs you get over the counter at a drugstore contain molecules which were first isolated in plants, created through aeons of evolutionary process. Many of those plants are being lost, and losing those plants is equivalent, in a very real way, to burning a library — deliberately destroying an inventory of molecules that we might never have a chance or an opportunity or an insight to create entirely from scratch.

For that reason, we have joined in Washington in a collaborative effort with the universities and biodiversity centers of this entire country. The hour is late, but surely we have the capacity to begin to use biology both to map ecosystems — to arrange and order our presence on the land in a thoughtful way which preserves strong functioning of biological diversity — and then to turn our technological capacity to the use of those resources for the benefit of all of us. For that reason I am here today — to salute the extraordinary foresight of the founding father of this facility, the generations of support and local effort that have gone into the Missouri Botanical Garden, and to suggest to you that you now stand at the threshold of an extraordinary expansion into a brand new future, the creation of a brand new phase in our collective history. Thank you very much. ■

MARK MOFFETT

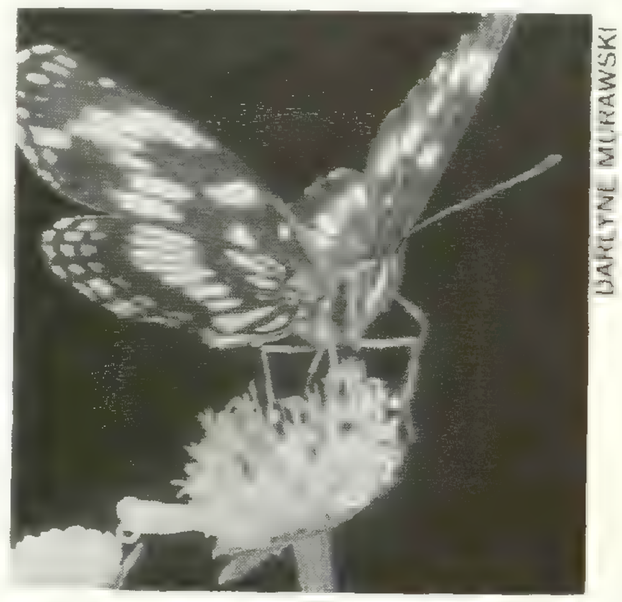
E. O. Wilson Awarded Henry Shaw Medal

Dr. Edward O. Wilson

TUESDAY, November 16, 1993, the Garden awarded the Henry Shaw Medal to Edward Osborne Wilson. Dr. Wilson, the Frank B. Baird Jr. Professor of Science and Curator in Entomology at the Museum of Comparative Zoology at Harvard University, was honored at the annual dinner held at the Ritz-Carlton hotel in honor of Henry Shaw Associates and Garden Fellows.

A world-renowned biologist and award-winning author, E. O. Wilson has made an extraordinary contribution to our understanding of life on Earth. He was honored with the Henry Shaw Medal for his leadership in focusing international attention on the issues surrounding biodiversity.

Dr. Wilson is famed worldwide for his studies in evolutionary biology, entomology, and biogeography. He has won the Pulitzer Prize twice, for *On Human Nature* in 1979, and for *The Ants* in 1991. He received the National Medal of Science in 1977 for his groundbreaking studies described in his book *Sociobiology* and was awarded the Crafoord Prize by the Royal Swedish Academy of Sciences in 1990. He is a member of the Board of Directors of The New York Botanical Garden and the World Wildlife Fund.



DARLYNE MURAWSKI

Photos from The Diversity of Life by E. O. Wilson, Harvard University Press 1992 (reprinted by persmission)

DARLYNE MURAWSKI

Dr. Wilson spoke eloquently about biodiversity during his visit to St. Louis. "This is a poorly explored planet," he explained. "We know of approximately one and a half million species of living things; but biologists estimate that there are anywhere from ten to 100 million species in the world, including all the microorganisms, fungi, and insects. There are undoubtedly some unknown species right here in St. Louis on the grounds of the Missouri Botanical Garden."

The loss of even one species depletes our genetic resources, weakening our ecosystem's ability to adapt and survive. Fifty percent of all living things are found only in tropical forests, and tens of thousands of these species are doomed every year, mostly by habitat destruction, Wilson said. These living things may harbor substances that are potentially useful as sources of pharmaceuticals, food crops, and other materials.

"Saving biodiversity is completely compatible with economic development," Wilson asserted. As an example he cited a powerful painkilling chemical discovered recently in the skin of a tropical frog. The substance is 100 times more potent than morphine but is not addictive.

The key to preserving the Earth's genetic resources is working with entire ecosystems, not just trying to save individual species, Wilson said. He points out that, with intelligent planning, most of the conflicts that arise between developers and conservationists can be avoided.

Wilson feels strongly that the more we discover and understand about the natural world, the more precious it becomes. "The number of species that can live in a given area declines rapidly as the natural habitat becomes smaller," he explained. "Americans have global concerns in many areas, and we need to recognize that loss of biodiversity has political consequences. Haiti is a prime example; many of their problems stem from a ruined environment. There will be many more Haitis in the world if national leaders don't begin to take action to protect natural resources."

RICHARD BENKOF

John K. Wallace, Jr. (left) presents the Henry Shaw Medal to Dr. Edward O. Wilson

continued on next page

Centennial of the Henry Shaw Medal

The Henry Shaw Medal, the highest honor bestowed by the Missouri Botanical Garden, was established by the Board of Trustees 100 years ago. Named for the Garden's founder, it honors those who have made a significant contribution to botanical research, horticulture, conservation, the Missouri Botanical Garden, or the museum community.

The Medal was awarded intermittently between 1893 and 1935, usually in honor of horticulturists who had introduced new plants. The Medal was not awarded again until 1978, when the presentation became an annual event, usually in conjunction with the annual dinner for major donors held in the fall. Occasionally the Henry Shaw Medal is awarded at other times as well.

For a complete listing of recipients of the Henry Shaw Medal and their accomplishments, please refer to the May/June 1993 *Bulletin*.

Loss of species can occur with frightening rapidity, Wilson pointed out. He cited the example documented by Garden researchers Calaway Dodson and the late Alwyn Gentry. The two scientists discovered dozens of new flowering plant species on a single mountain ridge in Ecuador, only to watch 90 percent of them disappear in a "mass extinction by chain saw" within a short time. "We only know about these species because Gentry and Dodson happened to be on the scene," said Wilson.

Peter H. Raven said, "Edward Wilson is one of the world's leading advocates of the need for understanding and preserving biodiversity. His work has had an extraordinary impact on scholarship and public perceptions of science, and we were delighted to be able to recognize his contribution by awarding him the Henry Shaw Medal."

O. Sage Wightman III Receives Henry Shaw Medal

AT the meeting of the Garden's Board of Trustees on October 27, 1993, O. Sage Wightman III was awarded the Henry Shaw Medal in recognition of his outstanding service to the Missouri Botanical Garden. Wightman, who has been a Garden Trustee since 1983, was presented with the Medal by John K. Wallace, president of the Board, who said:

"Sage Wightman was unanimously elected president of the Board of Trustees in January, 1991, and served this institution magnificently during his two-year tenure. He was cautious, conscientious, knowledgeable and available to provide the necessary leadership for the Board and the institution, and I can say without hesitation that Sage led us well."

RICHARD BENKOF

Presenting the Henry Shaw Medal to O. Sage Wightman III (center) are John K.Wallace, Jr. and Dr. Peter H. Raven.

During Wightman's tenure as President, the Garden realized many significant achievements. It maintained financial strength and stability, enabling its programs to continue to serve the public well. There was tremendous growth in the research program. The William T. Kemper Center for Home Gardening opened to the public. Volunteers, members, and services provided by the Garden continued to increase, with the 30,000th family member joining in May, 1992.

Guided by Wightman's leadership, the Trustees joined together to celebrate the 20th anniversary of Peter Raven's directorship of the Garden by providing significant financial support for the research program. The Center for Plant Conservation established its national headquarters at the Garden, creating one of the most important centers for plant research and preservation in the world. The Board established a new Cultural Diversity Council to increase multi-cultural representation and participation in at the Garden, and awarded the first Ernest E. Just Scholarship, which was created to inspire and support African-American students who pursue science degrees. We received a $500,000 challenge grant from the Kresge Foundation for the Conservation Center. The Education Division worked to develop the Litzsinger Road Ecology Center, made possible with support provided by the Litzsinger Road Ecology Foundation. HortLine went on-line as a gardening information service, providing recorded messages 24 hours a day. And public programs continued to expand, with the 1992 Japanese Festival breaking a record of 29,000 visitors in one weekend.

Wallace concluded, "Sage Wightman has served the Garden well and I would like at this time to express the Garden's sincere appreciation and genuine thanks by presenting him with the Henry Shaw Medal."

The Search for Ancistrocladus

IN 1987, when Garden researcher Duncan W. Thomas collected samples of a tall woody vine in the Korup National Park in the Southwest Province of Cameroon, he had no idea that he had just found a potential source for a treatment for AIDS. It would be four years before scientists realized the significance of this unprepossessing plant or understood that it was a completely new species.

In fact the species could have been overlooked entirely. This particular woody vine, or liana, has been found only in this single location in the African rain forest, where it grows in limited numbers. The plant is so similar to its relative *Ancistrocladus abbreviatus*, a species found throughout west and central Africa, that it was originally identified as that species. The difference might never have been noticed but for one crucial development: the plant was sent to the National Cancer Institute to be screened for possible activity against cancer and HIV, the virus that causes AIDS.

The Missouri Botanical Garden has collected plants in Africa and Madagascar for screening by NCI since 1986. When the sample from Korup National Park was tested, it showed significant activity against both HIV-1 and HIV-2. This was exciting news. The active chemical compound was isolated, named Michellamine B, and the results were published in the *Journal of Medicinal Chemistry* in 1991. Michellamine B showed great promise and was approved for preclinical testing at NCI.

In a perplexing development, extracts of *Ancistrocladus abbreviatus* samples collected subsequently from other sites in Africa failed to show the anti-HIV activity. In 1991 the NCI dispatched Thomas, now a private botanical consultant, to the original locality to try to locate additional specimens. Meanwhile, Thomas and Garden taxonomists reexamined the original herbarium specimen and realized that the plant with HIV activity differed in several slight but consistent ways from *Ancistrocladus abbreviatus*. It was, in fact, a previously unknown species of *Ancistrocladus*, named *korupensis* in honor of Korup National Park where it was found. "I doubt this would have been noticed if not for the results of the chemical tests," said Dr. James S. Miller, head of the Garden's Natural Products Research Program.

This previously unknown species is very promising as the source of a treatment for AIDS. It could easily have been overlooked.

This is not an unusual phenomenon. Of an estimated 250,000 species of flowering plants on Earth, the vast majority have never been extensively studied and perhaps ten percent have never even been named. Researchers at the Missouri Botanical Garden alone describe an average of 200 new species every year. *Ancistrocladus* is a genus of about 15 species found in west and central Africa and tropical Asia; one isolated species grows in eastern Kenya. *Ancistrocladus* are all canopy lianas from lowland rain forests. Since the vines grow so far above the forest floor, the leaves are hard to gather and very few herbarium specimens have been collected. The relationships among the species of *Ancistrocladus* are poorly understood.

Once the new species had been identified as the source of Michellamine B, it became imperative to learn more about it: how abundant was it in the wild, where exactly did it grow, and how could sufficient material be collected without endangering the wild population? In December of 1992, Jim Miller and Dr. Porter P. Lowry II, head of the Garden's Africa and Madagascar Department, visited Cameroon to establish an *Ancistrocladus* program.

Their goals were two: to determine how much, if any, plant material could be sustainably extracted from the wild population of *Ancistrocladus korupensis*, and to begin cultivating the plants to provide material for expanded future research. The cultivation program is run and administered by Cameroonians, with Prof. Johnson Jato of the University Centre for Health Sciences, University of

Yaounde, as project leader. Emmanual Jato manages the cultivation facility in Mundemba, the town just outside of Korup National Park, with the assistance of local workers. Andy Thomas, a horticultural consultant hired by the Garden, has visited to provide technical expertise.

Dr. Daniel Harder of the Garden's Africa and Madagascar Department also visited Cameroon to help set up the project, and Garden researcher Roy Gereau worked with Duncan Thomas to conduct the first survey of the wild population of *Ancistrocladus korupensis*. They found that the species is restricted in distribution and represented by a relatively small number of individuals, most of which grow inside the Park, where they are protected. The limited number of known plants makes it impossible to harvest sufficient research material from the wild.

The vast majority of flowering plants on Earth have never been extensively studied; 10% have never even been named.

However, samples of fallen *Ancistrocladus korupensis* leaves from the forest floor were sent to NCI for testing and proved to contain significant amounts of Michellamine B. This is an important discovery, for although leaves of many plants are harvested worldwide for medicinal and other uses, this is the first known case where leaf litter is utilized rather than fresh leaves.

A collection program was begun at once by the Garden and the University of Yaounde, working with the World Wide Fund for Nature's Korup Project in Mundemba. Because the environmental impact is negligible, permission was granted to collect the fallen *A. korupensis* leaves inside the park as well. Local laborers have been trained to identify the leaves and transport them to Park headquarters, where they are air dried and stored in sacks for shipment to NCI. This harvesting technique provides an extraordinary array of benefits: it yields sufficient material for testing, protects the species and its habitat, strengthens the local economy, and fosters a positive attitude toward rain forest conservation among the people of the region.

The cultivation project continues to be of major importance, since the possible future production of a drug from *A. korupensis* would require much larger quantities plant material than can be collected from the fallen leaves. Development of cultivation techniques for *A. korupensis* is being carried out at Mundemba by the Center for New Crops and Plant Products of the Department of Horticulture at Purdue University, with the Missouri Botanical Garden's ongoing participation.

Garden researchers are continuing to conduct botanical survey work to search for additional wild populations of *A. korupensis*, and Roy Gereau is preparing an exhaustive taxonomic revision of the entire genus. The next issue of the Garden's scientific journal *Novon* will publish the formal description of *Ancistrocladus korupensis*, authored by Duncan Thomas and Roy Gereau.

"*Ancistrocladus korupensis* is an excellent example of how little we know about plants in the tropics," said Dr. Miller. "This previously unknown species is very promising as a source of a treatment for AIDS, but how many more species are being lost forever before we have a chance to evaluate their potential?"

ANDY THOMAS

ANDY THOMAS

Left:* A. korupensis *plants under cultivation at the nursery in Mundemba. Above: Dr. Porter P. Lowry II (left) with Cameroonian workers drying fallen* Ancistrocladus *leaves collected from the forest floor.

Home Gardening

THE WINDOWSILL HERB GARDEN

WHAT could be better for chasing away the doldrums of winter than a sunny windowsill filled with beautiful, fragrant, and delicious herbs! Herbs are prized for their cosmetic, culinary, and medicinal value. They are among the easiest, most versatile plants to grow and thrive with minimal care. In the garden, herbs may be planted in formal designs such as an intricate knot garden, wagon wheel, or ladder garden, or they may be planted free-form for a more informal look. Herbs make excellent container plants for the gardener with limited space. They are also attractive when spilling out of window boxes, suspended in hanging baskets, or as topiaries.

Herbs are a good choice for the environmentally minded gardener as they generally require little water and fertilizer. They are also relatively free of pest and disease problems and often act as natural insect repellents in the vegetable garden. Herbs can be integrated into your lawn, lessening the dependency on herbicides and fertilizers. Herbs are beneficial in the flower garden as well, attracting pollinators such as butterflies, bees, and hummingbirds.

Growing Herbs Indoors

An indoor herb garden extends the gardening season and provides a year-round source for fresh herbs. In addition, an indoor herb garden can act as a nursery for propagating new plants for the outdoor garden or serve as a "holding area" for over-wintering tender perennial herbs.

Perhaps the greatest challenge when growing herbs indoors is providing them with sufficient sunlight. Herbs do best when grown in a very sunny window that receives between six and eight hours of direct sunlight each day (typically a southern or southwestern exposure). When growing herbs under natural light, be certain to rotate the pot every three to four days to insure uniform growth of the plant. If your most convenient window location does not receive enough sunlight, you can supplement natural lighting with fluorescent light. In general, for every hour of required sunlight, expose the plants to two hours of fluorescent light.

Herbs may be grown entirely under artificial light. Herbs grown in this manner will require between 14 and 16 hours of artificial light. Place herb plants no closer than five or six inches apart, and no farther than 15 inches from the light source.

Herbs demand good drainage for healthy growth. A potting mix of equal parts sand, commercial potting mix, peat moss, and perlite will provide an excellent medium for growing herbs indoors. When potting up your herbs choose clay pots, as they are more porous than plastic pots, allowing for better soil drainage.

Herbs prefer temperatures below 70° F. Be certain not to locate your indoor herb garden near a heat source such as a radiator or heat vent. If the air is dry where you live, place the herb pots in a tray of stones and keep the tray filled with water just up to the bottom of the pot. Providing ample humidity will promote good herbal growth while keeping the foliage succulent and tasty.

Most herbs will benefit from an occasional feeding with a liquid fertilizer such as fish emulsion or seaweed. In general, feed herbs every two weeks according to the manufacturer's instructions. Be certain not to overfeed your herbs, as too much fertilizer is far more likely to damage your herbs than too little.

Culinary Herbs

Perhaps the most popular reason for growing herbs indoors is for culinary use. In the kitchen, herbs accent and enhance the flavor of food. Herbs can also be used as garnishes, in drinks, in finger bowls, or as edible centerpieces. The following list of culinary herbs are easily propagated and well-suited to the indoor garden.

Chives and thyme - It is best to grow chives and thyme by cluster sowing, which permits these herbs to grow in a fairly thick stand. Cluster sow by evenly spreading 15–25 seeds across the surface of a four-inch clay pot filled with moistened potting mix. Cover the seeds with a fine layer of sand and place the pot in natural light but out of full direct sunlight. In the home, pots may be placed on the top of the refrigerator to provide bottom heat, hastening germination. Cover with a plastic bag to retain moisture or mist daily until germination.

Chives are perennial plants that grow from eight to ten inches tall. Chives prefer a nice sunny location and do very well in windowsill containers. Feed chives every couple of weeks with a liquid fertilizer, and provide the plant plenty of moisture.

Chives have been known from as far back as China in 3000 BC. Chives were used in ancient times to drive away evil spirits and they are reported to aid in the digestion of fatty foods. Use chives in cream cheese, sour cream, soups, salads, herb butter, and breads.

Thyme is a sturdy, low-growing perennial that rarely grows taller than eight to ten inches. A member of the mint family, thyme does very well indoors when provided with full sun and an occasional feeding. Thyme does not tolerate low humidity, therefore, be certain to provide thyme with an adequate source of humidity when growing the plant indoors.

Thyme is the symbol of strength and courage. Roman soldiers would often bathe in thyme water before engaging in battle. Thyme was used by the ancient Egyptians for embalming and it is still used as an ingredient in embalming fluid. It is also an ingredient in cough medicine. Use thyme to season meats, poultry, soups, and salad.

Basil and parsley - To grow basil and parsley, use the spot sowing technique. This is identical to cluster sowing except that only three to five seeds are sown per pot. When seedlings are between one and two inches tall, remove all but the hardiest and nurture the remaining seedlings to maturity.

Basil is an annual plant that grows from 18-24 inches tall. Basil does nicely indoors if pinched back and not allowed to flower. Pinch off the growing tips of branches to keep the plant compact and bushy. Basil prefers soil that is kept barely moist. Fertilize basil about once a month with a liquid fertilizer.

Basil is the symbol for courtship. Ancient Greeks and Romans believed that you must shout and rave when you plant basil. In France, "semer le basilic" translates to raving (as in

raving mad). In India, sprigs of basil are tied on the dead to protect them from otherworldly evil. Culinary uses for basil include pesto, vinegar, soups, herb butter, and stews.

Parsley is a biennial plant that can be grown indoors in partial shade or full sun. Germination of parsley seeds may be hastened if they are soaked for 24 hours before planting. The outside leaves of parsley should be cut to keep the plant about eight inches tall. Keep parsley well watered, especially when young.

The word parsley means "stone breaker." Ancient Romans wore crowns of parsley, as they believed it kept them from getting drunk. Parsley is often eaten after a meal to aid in digestion. Use parsley in soups, stews, vegetables, and fish dishes.

Rosemary and sage - Growing rosemary and sage can be done by rooting stem tip cuttings. Use a razor blade to take a three- to four-inch tip cutting just below a growing node on the parent plant. Strip the leaves on the bottom of the cutting, leaving a three-quarters to one-inch stem. Insert the stem into a small clay or plastic pot filled with one part sand and one part perlite. Water the rooting medium thoroughly and do not allow it to dry out. Mist daily until roots form. If desired, a rooting hormone may be applied to the stripped end of the stem cutting to hasten new root formation.

Rosemary is a perennial plant that grows from three to five feet tall. Rosemary can be grown indoors with less light than most herbs. Keep rosemary moist and do not allow the soil to dry out. Your rosemary plant will benefit from frequent misting and regular feeding with a dilute fertilizer.

Rosemary is the symbol of remembrance and has a reputation for strengthening memory. Rosemary was thought to prevent typhoid fever. During the typhoid fever plague of 1665, rosemary was placed on the handles of walking sticks and pouches to be sniffed when travelling through infected areas. Culinary uses for rosemary include meat dishes (especially lamb), baked potatoes, and herb butter.

Sage is a perennial plant that grows to be two feet tall. Sage prefers a sunny location and well drained soil. Water sage thoroughly, but allow soil to dry out before watering again. Indoors, leaves should be pinched back to keep the plant compact and bushy.

The sage plant has been highly praised on many continents for its powers of longevity. The word sage means "I am well." Sage has been used throughout history as a digestive aid. In the kitchen, sage is used to flavor poultry dishes, herb butter, vinegar, and tea.

Oregano and mint - The easiest way to start mint and oregano is by root division. The best time to take divisions of perennial herbs is approximately four to six weeks before the spring frost date. To obtain a root division, dig up the parent plant and cut or pull it apart into pieces. Transplant your new root divisions into a clay pots and water thoroughly.

A perennial herb, oregano makes an attractive container plant with leaves that trail over the sides of the pot. Oregano requires lots of sunlight and will tolerate dry soil and neglect. Pinch off growing shoots to keep your plant at a reasonable height.

Oregano is the symbol of happiness. The word oregano means "mountain brightness." Ancient Greeks used oregano to decorate their graves to insure a happy afterlife. Romans included oregano in their bridal wreaths as a symbol of a long and happy marriage. Culinary uses for oregano include spaghetti sauce, pizza sauce, and other Italian dishes.

Mints are good container plants and do very well indoors. Unlike many other herbs, mints will tolerate a minimum of two to three hours of sun and do not seem to mind having "wet feet". Mints should be trimmed back frequently to maintain a height of eight to ten feet.

Mint was the symbol of strength to the ancient Greeks. In medieval times, mint was used to clear the head and quicken the senses. Mint leaves are used in salads, desserts, cold drinks, teas, and as garnishes.

Whether you are an amateur or an expert, a windowsill garden provides an ideal winter gardening project. So, grab your favorite seed catalog, pour yourself a nice, hot cup of herbal tea, and dream of garden magic to come.

Katie Belisle,
Horticultural Coordinator

TELEPHONE HELP

The Garden has several telephone services available to assist you.

GardenLine **(314) 577-9400**
24-hour recorded information about Garden events, hours, admission and directions.Outside area code 314, call **1-800-642-8842** toll free, 24 hours a day.

Horticultural Answer Service (314) 577-5143
Monday through Saturday, 9:00 a.m. to noon. Master Gardeners are on hand to answer your gardening questions. The Answer Service does not have Saturday hours November through February.

HortLine **(314) 776-5522**
24-hour recorded gardening information is available with a touch tone telephone. You will need a brochure listing the hundreds of HortLine topics in order to use the service; you may request a brochure by calling the Kemper Center for Home Gardening at (314) 577-9440, 10 a.m. to 4 p.m. daily. **Plants in Bloom at the Garden** is updated weekly. Press 3 when you call HortLine.

Master Composter Hotline (314) 577-9555
9 a.m. to noon, Monday through Friday. Specially trained Master Gardeners are on hand to answer your questions about yard waste management techniques. After hours leave a message and your call will be returned. The Master Composter program is supported by the Monsanto Fund.

Kemper Center for Home Gardening

Open 10 a.m. to 4 p.m. daily.

The Plant Doctor is available 10 a.m. to noon and 1 to 3 p.m. Monday through Saturday.

Admission to the Kemper Center is free with regular Garden admission.

Calendar

every day

Free Walking Tours

1 p.m. daily. Meet the Garden Guides at the Ridgway Center ticket counter, rain or shine, for a fascinating tour of the Garden. Free with regular admission.

wednesdays & saturdays

Garden Walkers' Breakfast

7 a.m., grounds. In cooperation with the American Heart Association, the grounds open early every Wednesday and Saturday morning to encourage fitness walking. Greenhouses open at 9 a.m. Breakfast is available for purchase in the Gardenview Restaurant, 7 to 10:30 a.m. Admission is free on Wednesdays and Saturdays until noon.

continuing

Ecology of U.S. Agriculture: Past, Present, and Future

9 a.m. to 5 p.m. daily, Brookings Interpretive Center. A pictorial history of American agriculture demonstrates the role of agriculture in the environment, using visual displays, computers, and hands-on activities. Problems, solutions, and future challenges are presented. Developed jointly by the University of Missouri College of Agriculture, Food and Natural Resources, University Extension, and the Garden. Free with Garden admission.

january 22 -- february 20

Orchid Show

9 a.m. to 5 p.m. daily, Orthwein Floral Dispay Hall. An ancient Mayan ruin is the tropical setting for exotic blooms and colorful foliage, creating an oasis of color in the midst of winter. Enjoy hundreds of unusual and spectacular orchids from the Garden's award-winning collection, and learn how tropical and temperate orchids are threatened by habitat destruction. Free with Garden admission.

Members' Days

january 25 tuesday ***Potting Orchids***

1 p.m., Shoenberg Auditorium. A demonstration lecture by Marilyn LeDoux, senior horticulturist in charge of the Garden's orchid collection. Marilyn will discuss orchids and how to repot several types of orchids. Also enter a drawing for a beautiful Garden orchid. Free, for members only. Seating is limited.

february 16 wednesday ***Fun with Gourds!***

10:30 a.m., Shoenberg Auditorium. Chip Tynan of the Horticultural Answer Service will present a humorous and enlightening lecture on growing gourds, including the many uses of these humble plants in crafts and displays. Also enter a drawing for a gift certificate. Free, for members only. Seating is limited.

january 4-5

tuesday – wednesday

Garden Gate Shop Closed for Inventory

january 20 -- february 20

Orchids of Missouri

9 a.m. to 5 p.m. daily, Monsanto Hall, Ridgway Center. An exhibit of photography by Bill Summers, author of *Missouri Orchids*. The exhibition features native orchids and addresses the greatest threat to their survival in the wild -- habitat destruction. Free with Garden admission.

january 21 friday

Members' Preview: Orchid Show

5 to 8 p.m., Ridgway Center. Entertainment, cash bar. Enter a drawing for spectacular Garden orchids. Dinner buffet is available in the Gardenview Restaurant, and the annual Orchid Sale will debut in the Garden Gate Shop. Free, for members only. See highlight.

january 22 — february 20

Orchid Sale

9 a.m. to 5 p.m. daily, Garden Gate Shop. Members receive 20 percent discounts on all orchids and orchid gardening accessories.

New!

february 25 friday

Tea at the Garden: "Camellias in Winter"

Noon and 3 p.m., Spink Pavilion. Enjoy a sumptuous luncheon of afternoon tea at the Garden, the first in a planned quarterly series. The highlight of the afternoon is a stroll through the historic Linnean House to view the array of lovely camellias in full winter bloom. Tickets will be available by calling 577-5125 beginning February 1, 1994; price to be announced.

Brien A. Meilleur, Ph.D.

Brien A. Meilleur Is New President of CPC

DURING its October 15, 1993 meeting at The North Carolina Arboretum in Asheville, North Carolina, the Board of Trustees of the Center for Plant Conservation elected Brien A. Meilleur, Ph.D., president and executive director. He succeeds Donald A. Falk, who is returning to graduate school.

"Brien has a solid record of achievement in research, management, and fund-raising," said William A. Truslow, CPC Board Chairman. "He possesses the knowledge, skills and hands-on conservation experience to take the CPC into the next century."

Previously Dr. Meilleur was director of the Amy B. H. Greenwell Ethnobotanical Garden in Captain Cook, Hawaii, a part of the Bernice P. Bishop Museum, the Hawaii State Museum, where he was responsible for developing and guiding all aspects of garden research, education, and conservation. He was able to secure funds to create and annually support a research program in Hawaiian ethnobotany, to build a modern propagation facility, and to plan formally for construction of a Bishop Museum satellite facility at the site. This includes the complete mapping of the garden and all outplanted accessions, which more than tripled during his tenure.

Meilleur was named to the Plant Conservation Task Force of the Species Survival Commission of IUCN - The World Conservation Union during a task force meeting in London, November 16-18, 1993. The Plant Task Force acts as the principal source of advice to the Union and its members on the technical aspects of plant conservation worldwide.

Meilleur is currently Secretary/Treasurer of the Society of Ethnobiology. He received his Ph.D. degree in anthropology in 1986 from the University of Washington, Seattle.

Mellon Foundation Supports CPC Operations

The Center for Plant Conservation recently received a $750,000 general operating grant from The Andrew W. Mellon Foundation. The grant will help to support the work of the CPC over the next three years.

"The Center greatly appreciates this extraordinary vote of confidence in our ongoing and future plant conservation efforts," said Dr. Brien A. Meilleur, CPC president. "We extend our sincerest gratitude to the Mellon Foundation."

Garden In the National News

WHAT do the Today Show, *USA Today* and *People* magazine have in common? They, and many other newspapers, magazines, radio and television broadcasters, are bringing the important work being done at the Missouri Botanical Garden to the attention of an international audience.

Since the landmark August 1990 *National Geographic* feature on the Garden, the staff of the Garden's public relations office has been active in working with a wide array of regional, national and international news organizations. More than 200 national stories have been published or broadcast in the past three years -- reaching a cumulative audience of several hundred million people.

Douglas Arnold, manager of the public relations department, and Janine Adams, public relations specialist, say the success of the PR program lies in the strong media relationships they have built from coast-to-coast. "When journalists are calling you to ask your opinion of a new story idea, a two-way relationship is established -- making all the difference between one national story every three years and three national stories every year," said Adams.

Her work produces significant stories about the Garden's many projects. She has travelled in the field with Garden botanists to learn first-hand how they collect and identify plants. This experience led to a major story appearing on page one of the Washington Post in August 1992.

In addition, the Garden has been covered in *The New York Times*, Associated Press, *San Francisco Examiner*, the Today Show, *The Times* of London, *Southwest Airlines Spirit* magazine, *USA Today*, CBS' "How'd They Do That?", the Home Show with Gary Collins, *Walking* magazine, *Southern Living* magazine, *BioScience*, the Osgood Report, *People* magazine, *Smithsonian*, *Science* magazine, *Continental Airlines* magazine, Scripps-Howard News Service, *TWA Ambassador* magazine, *New Orleans Times-Picayune*, the *Christian Science Monitor*, *Los Angeles Times*, and hundreds of daily newspapers around the nation.

CLIFF WILLIS

Honored at the luncheon were (front row, from left): Mim Kittner, Ruth Buerke, Jeanette Neuner, Peter Raven, Sue Oertli, D'Arcy Elsperman, Nora Stern. Back row, from left: Jean Crowder, Fran Kroeger, Dorothy Kinyon. Not pictured: Sue Rapp, Carolyn Ullensvang, Lib Walbaum.

MEMBERSHIP SERVICES DESK CELEBRATES

A Tenth Anniversary

SINCE 1983 visitors have been welcomed to the Garden by volunteers at the Membership Services Desk in the Ridgway Center lobby. The success of the program has been extraordinary: in ten years the Desk has sold 34,000 memberships, generating $1.5 million in revenue for the Garden.

At a luncheon in Spink Pavilion on November 10, 1993, Dr. Raven paid tribute to the volunteers who have made this achievement possible. He said,

"A decade ago the idea of a Members' Desk was conceived through the Members' Board during Nora Stern's presidency. Nora, always eager to embrace new challenges for the Garden, asked Sue Oertli to chair a committee that would organize and implement the desk and its activities. Sue enthusiastically took on the task and was able to create the initial desk and organize the volunteers. It was first considered operational in June of 1983 with ten Board Members as volunteers. Its purpose, which has been maintained to this day, was to sell memberships, handle special needs of the members, and provide general information for all Garden visitors.

"Following the establishment of a permanent location, Mim Kittner assumed the chairmanship of the Desk in 1985 when Sue Oertli took over the responsibilities as president of the Members' Board. Mim, in her conscientious and caring manner, developed a strong volunteer training program increasing the number of Desk volunteers significantly. The Desk now has 49 regular volunteers.

"The strongest base of support that any institution can develop is through individuals. Without the Membership Services Desk, the Garden would not have achieved what it has been able to do. You have made every visitor feel welcome and valued, and with your help and the help of our membership we are confident that the Garden will remain one of the best assets for everyone in this community. Please accept my warmest thanks as I congratulate each of you for your contributions to this outstanding program."

1994 Members' Days

Jan. 25	*"Potting Orchids"*
Feb. 16	*"Gourds Are Fun!"*
Mar. 16	*"For the Birds"*
Apr. 28	*Tours of Specialty Gardens*
May 19	*Guided Sculpture Walk*
June 17	*Members' Musical Evening*
July 12	*"Don't Let Them Bug You"*
Aug. 6	*Dawn Photo Session*
Sept. 21	*"Dried Flower Arranging"*
Oct. 11	*Lecture and Tour of Tower Grove House*
Nov. 30	"Holiday Decorating with Natural Materials"
Dec. 10	*Holiday Concert*

Flowers and Candy for Your Valentine

This Valentine's Day send a year of flowers and fun with a Missouri Botanical Garden Membership and a Fannie May Chocolate Rose to your special Valentine. Call 577-5118 to order your Valentine membership. Gift recipients in the St. Louis metropolitan area will receive your unique Valentine gift delivered to their doorstep on February 14.

1994 Members' Travel Program

The Gardens of Wales

May 14 -- 22, 1994

Get your passport ready for a scenic tour of the gardens, castles, homes, and ancient archeological sites of Wales. The tour will stay at historic Bodysgallen Hall, with visits to the splendid gardens of LLewesog, Bodnant, Bryn Bras Castle, Foxbrush, Plas Newyydd, and Caernnarfon Castle. Special lectures will be given by Nigel Brown, curator of the Trebarth Botanic Garden at Bangor; Maldwyn Thomas of the BBC; and Michael Senior, garden historian. A visit to the Celtic and Druid Gallery on the Isle of Anglesey will include a lecture by a Druid archaeologist and a tour of his gardens. The tour moves to The Lake Country House Hotel for visits to Powis Castle, Whitton Hall, Llsdinam, Great Campston, Lower House Farm, Penpergwyn Lodge, and the Neuadd, home of *Hortus*, the international garden journal. At several stops the group will be entertained by the owners of the historic gardens.

For complete information on this exciting travel adventure, please call Brenda Banjak at (314) 577-9517.

Journey to the "Tropical Rain Forest" at the St. Louis Science Center

Garden members will receive a $1 discount on tickets for the film "Tropical Rain Forest", showing January 7 through May 5, 1994 at the St. Louis Science Center's OMNIMAX® Theater. Just show your Garden membership card at the Science Center Box Office. Regular ticket prices are $5 for adults, $4 for senior adults, and $4 for children ages 12 and under.

Experience the planet's most diverse ecosystems, from the forest canopy hundreds of feet in the air to the ground below your feet.

Call 289-4444 for showtimes and more information.

Volunteers Needed!

Volunteers are needed to work on special projects and events at the Garden. These tasks are varied and require a flexible schedule. Weekday jobs include stuffing and hand addressing envelopes, marking prices and setting up for sales in the Garden Gate Shop. Weekend jobs might include helping with events like the Japanese Festival.

Volunteers are also needed on a regular basis. The Library needs Russian translators, plus assistance with exchange files and new book acquisitions. Tower Grove House needs tour guides seven days a week. The Center for Plant Conservation is looking for receptionists and assistance in the Horticulture Division library. The Garden Gate Shop needs sales people. Horticulture is looking for workers in the Climatron and for indoor/outdoor work with Plant Records.

Please call Jeanne McGilligan at (314) 577-5187 for an application or more information.

Volunteer Profile *Midge Tooker*

CLIFF WILLIS

For more than 22 years, Marjorie (Midge) Maddox Tooker has shared her love of trees with hundreds of Garden visitors. She began coming to the Garden after the Second World War and as a Garden Guide she has witnessed the Garden's transformation into a world renowned institution.

A native of St. Louis, Midge graduated from Mary Institute, and from Vassar in 1944. She served in the Women's Army Corps in India and worked at Washington University before her marriage in 1948. She and her late husband Charles, another native St. Louisan, shared a love for nature in their travels on safaris, float trips, and trips to the western United States.

Over the years Midge has taught in the St. Louis Public Schools and has worked with programs for the Junior League and the United Nations. As a Garden Guide, she claims that she always has been a frustrated botanist and fulfilled her interest by learning about trees. She developed her expertise by joining the Webster Groves Nature Society, taking wildflower walks with Father Sullivan and Edgar Denison, and attending botany classes at Washington University. She has given Garden Tree Talks for the past several years. Together with Barbara Cook, she was co-chair of the Guides from 1985-1986.

The Garden has been fortunate to benefit from Midge's knowledge, time, and energy over the last quarter of a century. Everyone she has met has benefitted from her association, and we are delighted that she will continue to be involved with the Garden Guides.

GARDEN GATE SHOP

Closed for Inventory

The Garden Gate Shop will be closed for annual inventory January 4 and 5, 1994. Plan to come in beginning January 6 for special savings on reduced merchandise!

Orchid Sale

The annual orchid sale begins on January 21, in conjunction with the members' preview of the Orchid Show. The sale continues until February 20. Members receive 20 percent off on all orchids and orchid-growing accessories.

Valentine's Day Is February 14

Visit the Garden Gate Shop for a wide selection of delightful Valentine gifts for the sweetheart in your life.

Thank You to Holiday Decorators

The Garden extends warmest appreciation to all of the individuals and organizations who contributed so generously of their time and energy to decorate Tower Grove House for the holidays:

The Four Winds Garden Club
The Garden Club of St. Louis
The St. Louis Herb Society
The Twenty-Five Gardeners of Kirkwood
The Tower Grove House Auxiliary
The Members' Board, Missouri Botanical Garden
The Southwoods Garden Club of Shrewsbury
The Fleur de Lis Garden Club
The Webster Groves Garden Club #4
The Historical Committee
Joan Abeln
Bernadine McNeary
Tower Grove House Staff

Howard Hughes Medical Institute Grant Funds Teacher Training

THANKS to a $125,000 grant from the Howard Hughes Medical Institute, the Garden has initiated a Natural Science Institute for Elementary Teachers that will help thousands of children toward better understanding of the natural world and how it operates. The Garden was one of only 22 science museums throughout the United States to receive a grant this year from the Howard Hughes Medical Institute as part of its precollege science education program for science museums.

This innovative teacher training and leadership program will provide professional development for 40 elementary teachers, 10 each year, starting in 1994. Half of the participants will be from lower elementary grades (K-2) and half will be from grades 4-6.

Between January and May of each year, the ten participating teachers will attend a series of workshops on science content, hands-on activities, and instructional strategies for teaching about ecology, plants, and the environment. During the summer, these same participants will work closely with Garden education staff to help teach summer programs for children, practicing many of the lessons and activities with the help of Garden personnel. Finally, the participants will return to their own classrooms in the fall and incorporate new knowledge and skills into their own teaching. They will also conduct a number of workshops for other teachers in their schools.

"We are absolutely delighted that the Howard Hughes Medical Institute is supporting this teacher training program," said Dr. Larry DeBuhr, director of education. "The model we are using in the Natural History Institute for Elementary Teachers will allow us to develop a sustained relationship with participants, such that at the end of the project, there will be a corps of 40 elementary teachers with special talents in ecology and environmental science that will enhance science education in St. Louis schools."

Stream Ecology Grant from Garvey Foundation

THE GARDEN has received an $8,000 grant from the Edward Chase Garvey Memorial Foundation to help support an integrated aquatic biology and water quality program in the Education Division. The Edward Chase Garvey Memorial Foundation joins the U. S. Environmental Protection Agency and the Allen P. and Josephine B. Green Foundation in sponsoring this project.

With this generous contribution, the Garden can move ahead to develop a middle school curriculum for use in science classes throughout Missouri. This kit will include a kit of instructional materials that will be loaned to teachers and a stream ecology journal for school children. Each year, children ages 12 to 13 will be able to participate in the Stream Ecology Program, sharing data with other students through a computer network. Finally, middle school teachers will be able to participate in a series of summer workshops in aquatic ecology and water quality, helping them to assist their students in understanding these important issues.

Nancy D'Arcy Returns to the Garden — We are happy to announce that the St. Louis Public School District has once again assigned Nancy D'Arcy as a special teacher at the Garden for this school year. (Please see the profile of Nancy in the November/December 1992 *Bulletin*). This unique partnership between the Garden and the school district is another example of the cooperation between the two institutions. Welcome back, Nancy!

Ecologist Leads Program Development at the Litzsinger Road Ecology Center

WILLIAM DAVIT

Judith Bramble at the Litzsinger Road Ecology Center

JUDITH BRAMBLE, Ph.D., who recently accepted the position of coordinator of teacher training for the Garden, previously taught ecology at St. Louis University and Washington University. She has primary responsibility for developing and implementing teacher training programs at the Litzsinger Road Ecology Center (LREC). The LREC is a 34-acre outdoor environmental education center in Ladue that is operated by the Garden.

Dr. Bramble's involvement with the Garden began in 1991, when she was hired as a consultant to help direct the long-range planning for education programs at the LREC. She traveled throughout the United States visiting other environmental education centers, talking with environmental educators, and evaluating outdoor programs. She also convened and directed an advisory panel, and her report now serves as the basis for program development at the LREC.

"Judy's ability to merge field ecology with teaching methods and an understanding of the scientific process allows her to make a very valuable contribution to education at the Garden," said Dr. Larry DeBuhr, director of the Education Division.

In her role as an ecologist Dr. Bramble assisted with a biosurvey that identified many of the plants and animals at the LREC site and forms baseline data for comparison in future years. She initiated and now supervises a program where students and teachers can apply for small grants to use the LREC for research and educational projects. And she is working on a field manual that will help teachers throughout Missouri better use outdoor laboratories with their own students.

"Science teaching should engage students actively in research projects," Dr. Bramble said. Programs at the Litzsinger Road Ecology Center will provide opportunities for students and teachers to understand better the process of science through ongoing, hands-on exploration and experimentation. As participants learn more about ecology, natural history and the environment, they will gain a greater awareness of and appreciation for the natural world.

"I feel very strongly that if we show students how interesting, creative, and relevant the process of science is, they will want to take more science courses and consider careers in science," said Dr. Bramble. "By working with teachers, we have a unique opportunity to improve the quality of science education and to convey a sense of excitement about science, ecology, and the environment to our children."

NSF Supports A Landmark Project To Promote Science Literacy

THE National Science Foundation has funded a curriculum development project that will enable the Missouri Botanical Garden and four other public gardens to develop groundbreaking instructional materials that will significantly change how school classes use the educational resources of the institutions.

The grant was awarded to all five gardens on behalf of the Midwest Consortium of Botanical Gardens and Arboreta. The Missouri Botanical Garden, along with the Chicago Botanic Garden, the Minnesota Landscape Arboretum, the Morton Arboretum, and the Holden Arboretum are members of this consortium.

"Too many school field trips to our institutions are one-time visits that are not at all related to what happens in the classroom before the class visits or what happens after they return to their schools," says Dr. Larry E. DeBuhr, director of education at the Garden. "This joint project with other gardens in the Midwest Consortium will enable us to develop very specific pre-visit and post-visit lessons which can be taught in the school classrooms and that relate directly to the field trips to our gardens."

The project will include "field testing" at various schools, allowing for evaluation and modifications of the lessons prior to their use. Teachers will also be trained in the use of the lessons.

The success of this project is being watched by staff at other public gardens. All of the materials will be shared with other botanical gardens and arboreta around the country, and the program can serve as a model for science museums. In a letter to the National Science Foundation, Susan H. Lathrop, executive director of the American Association of Botanical Gardens and Arboreta writes, "...I am particularly pleased that they (the Midwest Consortium) have proposed to address the national issue of science literacy in such a way that others can make use of what they develop."

New Director of Litzsinger Road Ecology Center

THE GARDEN is pleased to announce that Celeste Prussia has joined the staff as director of the Litzsinger Road Ecology Center, as of December, 1993. Ms. Prussia was formerly the director of the Goodwin Conservation Center in Hampton, Connecticut.

Ms. Prussia has a M.S. degree in botany and forest ecology from the University of Rhode Island and a B.S. degree in environmental biology from Eastern Connecticut University. As director of the Goodwin Conservation Center, she has been responsible for the design, development, and implementation of public education programs for children and adults. She also was instrumental in the development of a state-wide network of environmental organizations sharing expertise and resources.

"We are very pleased that we have been able to hire someone of the quality and experience of Celeste Prussia to help run our outdoor environmental education programs at the Litzsinger Road Ecology Center," says Dr. Larry DeBuhr, director of education. "Not only will Celeste supervise the programs at the Litzsinger Road Ecology Center, she will help to plan all of our outdoor environmental education efforts and coordinate those efforts with other organizations in St. Louis."

Watch future issues of the Bulletin for a profile of Celeste Prussia and activities at the Litzsinger Road Ecology Center.
—Editor

Henry Shaw Academy students at work with the Horticulture Division last summer. Left: Amanda Jeter Below: David Lampe Bottom: Ben White

HENRY SHAW ACADEMY

Summer Apprenticeships

Teens Work with Horticulture Staff

THIS PAST SUMMER the Garden Apprenticeship Program of the Henry Shaw Academy completed its fifth successful year at the Garden. The program gives students ages 14-18 the opportunity to work alongside the Garden's horticulture staff.

Students who are accepted for the program participate in one of three sessions, working in the mornings to avoid the summer's midday heat. Ben White, age 15, commented, "The only hard part was getting here by 7 a.m., which is when the MBG gardeners arrive!"

Project areas include the rose gardens, the Japanese Garden, the Climatron, and the Shoenberg Temperate House. Amanda Jeter, age 16, especially liked being able to work in staff areas behind the scenes. Under the guidance of the Garden's expert horticulturists, students learn about plants, soils, and landscaping maintenance, and practice such skills as weeding, pruning, watering, planting, digging, mulching, and tool maintenance. As Jamie Schlereth, age 16 said, "I wanted a chance to work with experts before deciding upon a career working with plants."

The Garden Apprenticeship Program is part of the Henry Shaw Academy Science Camp. The Program runs during the month of July and can take five students each session. For further information about next year's Garden Apprenticeship Program and the Henry Shaw Academy, please call Jeff DePew, HSA Coordinator, at 577-5135.

RICHARD BENKOF

Cora Sculpture Installed

CORA, a charming portrait of a little girl by the noted St. Louis sculptor Don F. Wiegand, is a gift to the Garden in memory of Leicester Busch Faust from his granddaughters Mary Dangremond of Old Lyme, Connecticut, and Jane Keough of Exeter, New Hampshire. The 40-inch life-size bronze, the artist's prized Number One casting, was installed in the Audrey Heckman Rock Garden outside the entrance to the Shoenberg Temperate House on November 2, 1993.

Leicester B. Faust served as a Garden Trustee from 1954 until his death in 1979. He was elected an Emeritus Trustee in 1973.

Dr. Peter H. Raven said, "We are absolutely delighted to have *Cora* on display. This charming and unaffected expression of the openness and enthusiasm of childhood is a wonderful addition to the Garden, and we are deeply grateful to Mrs. Leicester B. Faust and Don Wiegand for making it possible for all our visitors to enjoy this sculpture."

CLIFF WILLIS

ASSITIVE LISTENING DEVICE (ALD) Available -- Laurel Zimmer (left), a plant mounter on the staff of the Garden's herbarium who is hearing-impaired, demonstrates an ALD on a tour of the grounds with Mary Borgman, a visitor services staff member. The ALD amplifies the tour guide's voice and transmits it to headphones worn by the user. The cordless, portable device is available for use in the Shoenberg Auditorium or outdoors at the Garden. The Garden also has a TDD, or telecommunications decoding device, installed at the ticket counter in the Ridgway Center. The device can be used by people with a specially equipped telephone to send and receive messages in writing. The number of the TDD is (314) 577-9430.

Garden Hosts ENPA Annual Meeting

September 24-26, 1993, the Garden hosted the annual meeting of the Eastern Native Plant Alliance (ENPA), which was held in conjunction with the quarterly board meeting of the Missouri Native Plant Society. About 60 people participated in the meeting, which included presentations by the Center for Plant Conservation and Flora of North America project, and field trips to Shaw Arboretum and other natural sites in area.

ENPA is an association of public gardens, native plant societies, nurseries, organizations, and individuals that work to promote conservation of native plants in the eastern United States and southeastern Canada. ENPA seeks to educate the public about native plants and to encourage effective joint action on conservation issues. These include invasion of natural areas by exotic plant species; the impact of commercial collecting from the wild on plant populations; nursery practices in marketing native plants; preservation of natural areas; understanding and protection of genetic diversity in wild plant communities; and responsible, sustainable use of native plants to enhance human life.

Below: Participants in the ENPA conference on a field trip to Valley View Glades Natural Area near St. Louis.

GEORGE YATSKIEVYCH

LIBRARY NEWS

Jonathan D. Sauer, who received his training in botany at the Garden while earning his M.A. in 1948 and his Ph.D. in 1950 from Washington University, has made an important gift to the Garden's library and archives. Dr. Sauer became a professor of botany and geography at the University of Wisconsin and, later, at the University of California-Los Angeles, after which he became director of the herbarium at UCLA.

Now that he is retired, Dr. Sauer has kindly donated to our library his collection of books, journals, reprints, and correspondence that relates to the Garden. Especially important is his correspondence with the late Edgar Anderson, a distinguished botanist and former director of the Garden. Other libraries also will benefit from Dr. Sauer's generous gift, as titles that are already in our collection will be passed on to them.

Stanford Dissertations — Through the efforts of Professor John Hunter Thomas of the Department of Biological Sciences at Stanford University, the Garden's library has received an important gift of 73 theses and dissertations on systematic botany written by students at the Dudley Herbarium at Stanford. The collection, reproduced on archival paper, is one of only three sets made available. It includes the work of botanists Lyman Benson and Dennis Breedlove and spans the period from 1896 to 1972.

Over the years the Garden library has tried to obtain copies of all dissertations on systematic and floristic botany that are available from University Microfilms, Inc. However, many important theses, especially older ones, are not available through commercial vendors. It is only through the efforts of individuals like Prof. Thomas that these classic original studies are made accessible. The collection has been catalogued and placed in the OCLC, or Online Computer Library Center, database, where it is available to other scientists through the library's Inter Library Loan service.

Garden Signs Sister-Institution Agreement with Russian Botanical Institute

THE V. L. Komarov Botanical Institute in St. Petersburg, Russia, and the Missouri Botanical Garden have established a sister-institution relationship in order to stabilize and strengthen collaboration between them and promote botanical science worldwide.

As reported in earlier issues of the *Bulletin*, time has taken its toll on the century-old facilities of the Komarov Botanical Institute. Botanists there are faced with a very real concern that the deterioration of the physical structures will threaten the invaluable collections of living plants and dried plant specimens. As part of this agreement, the Missouri Botanical Garden has agreed to continue to help seek funding to support the programs and preserve the physical facilities and collections of the Komarov Institute.

In addition, the two institutions plan to collaborate in the development of a computerized checklist of the plants of northeastern Eurasia as a first step toward a jointly coordinated Flora of Northeast Eurasia, projected to be published in 20 volumes and made available as a computerized database. The area to be covered will include a large portion of the territory of the former Soviet Union, Mongolia, northern Iraq, northern Iran, northeastern Turkey, Manchuria and portions of northern China.

The Komarov is one of the most important botanical institutions in the world. It includes a botanic garden founded in 1714 by Peter the Great. The Komarov houses the third largest herbarium in the world, with nearly six million specimens of dried, pressed plants. In addition, its greenhouses safeguard a collection of about 6,000 species of living plants, including many that are in danger of extinction and some that are extinct in the wild.

Dr. Peter H. Raven, director, said, "The Missouri Botanical Garden is delighted to formalize its relationship with the Komarov, and we look forward to many, many years of cooperation between the two institutions."

RICHARD BENKOF

At left: Jennifer Hedin and Guanghua Zhu

GRADUATE STUDENTS IN THE NEWS

Two Receive Prestigious NSF Awards

TWO graduate students at the Garden have received Doctoral Dissertation Research Grants from the National Science Foundation (NSF). These prestigious awards are highly competitive.

Jennifer Hedin, who is working toward her Ph.D. from Washington University, is studying neotropical plants, specifically the genus *Salacia* in the Hippocrateaceae family. The NSF award will cover the cost of field work in Brazil, Peru, and Ecuador, including boat rentals. Travel by boat is essential in the Amazonian forests, which are inundated when the Amazon River floods during the annual wet season. Jennifer began her studies working with the late Dr. Alwyn H. Gentry and is currently working with Dr. P. Mick Richardson.

Guanghua Zhu is a doctoral candidate at the University of Missouri-St. Louis. Dr. Thomas B. Croat is his advisor. Guanghua, who is originally from Inner Mongolia, worked in Beijing before coming to St. Louis. He is studying herbaceous neotropical plants in the Araceae, or aroid, family, specifically the species *Dracontium*. These plants form large bulbs below the surface of the forest and each year sprout a single leaf up to six feet in height. The flowers of *Dracontium* have an extremely unpleasant odor which attracts flies that pollinate the plants. Guanghua's NSF grant will support field work in Venezuela, Ecuador, and Costa Rica.

SISTER INSTITUTION continued

CONFERENCE IN ARUSHA, TANZANIA **-- Recent activities of the Garden's collecting program for the National Cancer Institute included a national conference in Tanzania organized by Dr. William Mziray, director of the National Herbarium of Tanzania (see July/August 1993 *Bulletin*) and botanists from throughout the country to examine the current status of botanical research in Tanzania and establish priorities for the future. Garden researchers Dr. Porter P. Lowry II, Roy E. Gereau, and Heidi H. Schmidt attended the conference.**

CLIFF WILLIS

GABONESE VISIT GARDEN **— Representatives of CENAREST (Centre National de Recherche Scientifique et Technologique) of Gabon visited the Garden November 10-11 to discuss plant collecting for the National Cancer Institute and other possible collaborative programs. An accord was signed outlining future cooperative botanical research between the Garden and CENAREST. Shown at the Garden (seated, from left): Dr. Lucien Obam, scientific advisor at CENAREST; Dr. Peter H. Raven; and Dr. Nze-Ekekang, head of the Institute of Pharmacopea and Traditional Medicine at CENAREST. Standing, from left: Dr. James S. Miller, head of the Garden's Natural Products Research Program, and Dr. Porter P. Lowry II, head of the MBG Research Division's Africa and Madagascar Department.**

TRUSTEE PROFILE

Edith Swift Jenkin Spink

ON November 17, 1993, the Garden's Board of Trustees elected Mrs. C. C. Johnson Spink to the Board as an Emeritus Trustee.

Mrs. Spink's interest and involvement with the Garden extends over many years. Her late husband, Johnson, was a Garden Trustee from 1974 until his death in 1992, and he served as president of the Board from 1982 to 1984. Together they made possible the renovation of the Flora Gate House, now called the Edith and Johnson Spink Pavilion, and the Spink Gallery in the Ridgway Center, which houses the magnificent display of Boehm porcelain birds and flowers which they collected.

Mrs. Spink's involvement with the Garden actually preceded that of her husband. "I was active on the Women's Committee during the 1950s," she recalled. "We organized benefits and events, and eventually became part of the Friends organization. I also served on the Tower Grove House Historical Committee for several years in the 1960s. In fact, my step-great grandfather, Elihu Shepard, was a friend of Henry Shaw's!"

Mrs. Spink, a native St. Louisan, is currently serving her tenth consecutive two-year term as mayor of the City of Ladue. She has a distinguished record of community activities, including service as an officer on the boards of Edgewood Children's Center, St. Louis Children's Hospital, the Visiting Nurse Association, and the United Fund, among many others.

Mrs. Spink has been honored with the YWCA Women in Government Award and the Garden Club of America's Medal of Merit. She was a Globe Democrat Woman of Achievement and was the first woman to receive the Distinguished Alumni Award from Washington University School of Law. Currently she serves on the Board of Directors of Ranken Technical College, the Women's Exchange, and the World Affairs Council of St. Louis, plus the Advisory Board of the Rossman School and the Senior Olympics. She is a graduate of Mary Institute and graduated first in her class from the Washington University School of Law. She is a member of the American, Missouri, and St. Louis Bar Associations.

"I am very pleased to be a part of the Garden's Board of Trustees," Mrs. Spink said. "The Garden's activities in research and education are of enormous importance for the future of our world."

Dr. Peter H. Raven said, "Edie Spink's deep interest in the Garden extends back over many years. I am really delighted at her willingness to continue her great contributions by serving on the Board, and I look forward to working with her over the years to come."

RICHARD BENKOF

CLIFF WILLIS

CONSUL GENERAL OF JAPAN -- On October 8, 1993, the Honorable Takaski Matsumoto, Consul General of Japan at Kansas City, visited the Garden. From left: Mr. and Mrs. Matsumoto; Dr. Peter H. Raven, director; Mr. and Mrs. Bruce S. Buckland. Mr. Buckland is Honorary Consul General of Japan at St. Louis.

PHOTOGRAPHY EXHIBIT -- On November 5, 1993, the Garden hosted a reception for the opening of an exhibit of magnificent floral photographs by Sir Peter Smithers. Smithers, an award-winning photographer of international distinction, photographs flowers that he grows himself in his garden at the southern foot of the Swiss Alps. Smithers's photograph **Hana Kisoi** *(Floral Rivalry), a 1987 gift to the Garden in honor of Elizabeth R. and Joseph F. Ruwitch's fiftieth wedding anniversary from their children, is on permanent display in the Ridgway Center. Shown at the reception are (from left): Dr. Peter H. Raven, with Amelia Otway Smithers and her mother, Lady Smithers. Sir Peter was unable to attend.*

BERNARD NIETSCHMANN VISITS -- Dr. Bernard Nietschmann, professor of geography at the University of California, Berkeley, and a member of the Committee for Research and Exploration of the National Geographic Society, visited the Garden November 1-2, 1993. Dr. Nietschmann, who is a noted expert on Central America, met with Garden research staff and gave a lecture in Shoenberg Auditorium entitled "The Indigenous Biodiversity Mapping Project in Central America." Shown from left: Dr. Gerrit Davidse, head of the Flora Mesoamericana project for the Garden; Olga Martha Montiel, assistant to the director; Bernard Nietschmann, with his daughter Tangni; and Dr. James S. Miller, head of the Garden's Natural Products Research Program.

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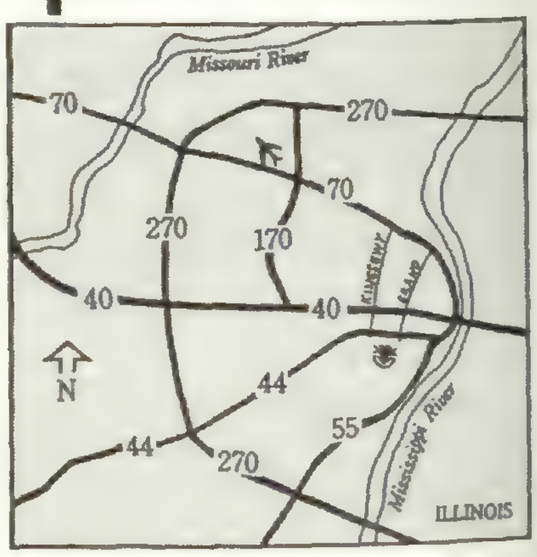

VISITORS TO THE GARDEN will have an easier time getting here in 1994. Sometime in January the new Kingshighway viaduct will open between Manchester and Highway 44, allowing direct access to traffic moving north and south. This section of Kingshighway was closed by the City of St. Louis two years ago to allow for construction of the new span. Please watch your newspapers and broadcast media for announcement of the exact date of reopening.

C O M I N G S O O N

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B U L L E T I N

Missouri Botanical Garden

MARCH/
APRIL
1994

VOLUME LXXXII
NUMBER TWO

Comment

MISSOURI BOTANICAL GARDEN MISSION: "TO DISCOVER AND SHARE KNOWLEDGE ABOUT PLANTS AND THEIR ENVIRONMENT, IN ORDER TO PRESERVE AND ENRICH LIFE."

With springtime just around the corner, we are delighted to announce that, thanks to the overwhelming generosity of our friends and the community, the Partnership Campaign, the Garden's capital fund drive, has attained 50 percent of its goal with over $14 million in gifts and pledges. Planning is well underway on our new research building; this exciting project is described by our outstanding St. Louis architects, Ted Christner and Lou Saur, in an interview on page 3. We are also immersed in plans for the second major phase of the campaign, the outdoor demonstration and associated gardens at the Kemper Center for Home Gardening. Watch your mail for a special invitation to join the Members' Board in their sponsorship of the Entry Court Demonstration Garden at the Kemper Center, and see the story on page 4 for more details on this splendid project.

Visitors this spring will notice the new construction in the English Woodland Garden. The area is being extended to the north, with extensive replanting, a new bog feature in the southern section, and paved paths that make the area fully accessible to people with disabilities. Watch the May *Bulletin* for more details of the improvements to this popular feature.

We extend our very warmest welcome to our new Trustees, (see page 7), and the new members of the Members' Board, (see page 14). We also congratulate the Garden Guides, our dedicated group of docents, who have been leading visitors of all ages on informative tours of the grounds for the past 25 years. We congratulate them on their anniversary, and extend our warmest thanks for their untiring efforts, which make a visit to the Garden a wonderful experience for so many people.

Our mission in international botanical research continues to grow, with fascinating developments all over the world. On pages 15–17 you can see accounts of a thrilling new discovery in Costa Rica, an innovative new program in Suriname, and our highly regarded bryology department.

Springtime brings an exciting array of activities and events. Don't miss our popular annual "Gardening by Design" Lecture Series in March, the beautiful Spring Flower Show, or the Chinese celebration coming up in April. We look forward to seeing you here!

— Peter H. Raven, Director

COLD WARRIORS -- During the snowstorms this winter, while most St. Louisans stayed home, the Garden's staff went on emergency duty. The Garden is open to visitors every day except Christmas, so the outdoor horticulture staff arrived at 5 a.m. instead of their usual 7 a.m., working in subzero temperatures to clear snow from about two miles of walkways and parking areas. The maintenance staff also had their hands full when our natural gas supply went on interrupt service, a cost saving measure adopted last year. Workers had to convert to the emergency backup heating oil system overnight, but thanks to their efforts and emergency thermostat controls in the greenhouses, the Garden and its plants came through the Polar Express with no damage.

Moving?
Please remember to send us your new address.

To avoid missing any of your membership mailings, we need notification of your new address at least three weeks before you move. Please enclose the mailing label on the back cover of this *Bulletin* and mail to:

Name:_____

Old Address:

Street_____

City_____

State_____ Zip_____

New Address:

Date effective:_____

Street_____

City_____

State_____ Zip_____

On the Cover

Three Sturgeons fountain by Sirio Tofanari graces the reflecting pools in the Swift Family Garden.

Photo by Richard Benkof

Editor

Susan Wooleyhan Caine
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The BULLETIN is sent to every member of the Garden as a benefit of membership. For a contribution of as little as $45 per year, members also are entitled to: free admission to the Garden, Shaw Arboretum, and Tower Grove House; invitations to special events and receptions; announcements of all lectures and classes; discounts in the Garden Gate Shop and course fees; and the opportunity for travel, domestic and abroad, with other members. For information, please call (314) 577-5118.

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An Interview with Theodore C. Christner and Louis R. Saur, Architects

Intensive planning is underway for the facility that will provide a new headquarters for the Garden's research program. The new building will be constructed on the southwest corner of Shaw and Vandeventer, with construction scheduled to begin in 1995. A team of consultants, engineers, and architects is working on the project under the leadership of the St. Louis architectural firms the Christner Partnership, Inc., and Louis R. Saur & Associates. Saur, who is responsible for design of the new building, also designed the William T. Kemper Center for Home Gardening at the Garden. The Christner Partnership, which is coordinating the team for the new building under the direction of president Theodore C. Christner, handled the Shoenberg Temperate House and the Brookings Interpretive Center, and were major contributors to the renovation of the Climatron. Recently the two architects discussed the planning for the new building with the Bulletin.

Planning the New Research Building

We have been hearing a lot about the new research building. What aspects of the project are you working on now?

Saur: The planning for a project like this is unusually complex. In order to create the most cost-effective and environmentally conscious building possible, we are working to integrate the ideas of structural and mechanical engineers, library planners, and environmental consultants at the very earliest stages of the design process. We also are listening to the staff who will be the primary users of the facility. This building will be the permanent home of the Garden's research program; we're looking at everything we can to ensure its longevity, including earthquake protection.

Lou Saur (left) and Ted Christner

Christner: A key aspect of this building will be its relationship to the Garden and to the urban neighborhood. With four stories, its presence will make a strong visual impact, highly visible from I-44; at the same time, it will be harmonious with the industrial tradition of the neighborhood. We're placing the building on its site so that its entry will form a link with the intersection plaza at Shaw and Vandeventer and welcome visitors to the Garden. In a sense, the new building will give visitors their first image of the botanical garden experience.

Saur: We considered the possibility of keeping the existing Polar Wave Building that is on the site now, but our studies indicated that it wasn't feasible. However, the new building will occupy a similar space and mass with a handsome facade of red brick and glass, so it will be in harmony with the traditional look of the neighborhood.

What kinds of features can we anticipate in the new building?

Saur: It is crucial that the herbarium collection be easily accessible to the scientists who use it. However, the dried plants must be stored in a climate-controlled area separate from office spaces. We have designed a series of vestibules that provide access to the herbarium and have lots of counter space. The office areas will have an open, loft-like feel, with ample natural lighting and views of the outdoors. The library will occupy the entire top floor, with beautiful meeting spaces and views out over the city. The entrance will have an atrium-like area and an interpretive center where visitors will view exhibits about the building and the research program. We also plan to have a visitor gallery for the mechanical systems, where people can actually see some of the energy-saving aspects of the structure.

Christner: One of the major requirements for this facility is expandability. There is a strong likelihood that the herbarium collection will grow substantially in the future, so the building is designed as a series of modules, which will make it easy to enlarge the facility as needed in the future.

How do the concepts of "green" architecture relate to this building?

Christner: So-called "green" architecture refers to construction that has the lowest possible impact on natural resources. It is energy efficient, utilizes renewable or sustainable materials, and provides healthful, productive surroundings for its users. Every phase of the Garden's research building is being intensively studied with these criteria in mind. A number of these things have not been extensively studied before, and the answers are not simple. We are working very hard to reach an effective balance between costs and value, to create the very best building possible within the budget.

What would you say is the most important objective for this project?

Saur: This building will stand as a symbol of the Garden and its mission: "to discover and share knowledge about plants, in order to preserve and enrich life." It must communicate that ideal to everyone who sees it and uses it. We hope it will serve as a monument to the Garden's message of caring for and sustaining the environment. ■

MISSOURI BOTANICAL
FEB 24 1994
GARDEN LIBRARY

Garden for All

A GENEROUS GIFT from Elizabeth R. Ruwitch will support construction of the Garden for All. Mrs. Ruwitch has made the gift in memory of her late husband, Joseph F. Ruwitch, Sr., who served as a Trustee Emeritus of the Garden from 1988 until his death in 1992. Mr. Ruwitch's interest in the Garden began in 1968 when, as a newly retired executive, he enrolled in a class here on planting seeds. The seed was planted for a "growing" hobby and a continuing interest in gardening, and over the years he and his wife became devoted members of the Garden. Together they supported the Climatron, the Ridgway Center, the Peony Garden in the Japanese Garden, and the research program.

RICHARD BENKOF

Mrs. Ruwitch (center) with her daughter, Jane Mitchell (left), and her granddaughter, Lucy Ruwitch.

The Garden for All is designed to showcase creative ways to make a garden accessible and comfortable for people with disabilities. Raised beds and specialized accessories and tools will assist gardeners who use wheelchairs or walking aids. Signs in Braille, audio descriptions, and plants chosen for fragrance and texture will enhance the garden for people with visual disabilities. "This garden will be particularly appropriate as a memorial to Joe, who was so generous in spirit," said Dr. Peter H. Raven.

Mr. Ruwitch was a native of Chicago. He came to St. Louis in 1938 and became active in community affairs, supporting and serving on the boards of many civic organizations. His strong commitment to the community is a tradition continued by his wife and their children. "Joe loved the Garden and the St. Louis community, and I am so pleased to be able to commemorate his feelings in this way," said Mrs. Ruwitch.

The Entry Court

A Challenge to the Members

THE GARDEN'S MEMBERS' BOARD loves a good challenge, so it is no wonder that the Board has agreed to take the lead in sponsoring the Entry Court of the William T. Kemper Center for Home Gardening.

Since the Kemper Center's central education building opened in June 1991, it has served almost one million members and visitors, providing the latest information on home horticulture . Soon ground will be broken for the 24 demonstration gardens to surround the building, completing a facility more than two decades on the drawing board that will offer the most advanced services of its kind in the world.

"The Kemper Center has rapidly become one of the Garden's most important programs and it will only increase our renown in years to come," announced Mrs. Robert Tschudy, president of the Members' Board. "We wanted to find a way that the members could be symbolically 'present' to welcome everyone to the Center on behalf of the Garden. We decided that the best way to achieve this was to ask the members to sponsor the Entry Court, which is located at the main point of access to both the building and the demonstration gardens. We have already begun our own internal drive for leadership gifts from the Members' Board and will be inviting the rest of the membership to participate through a special mailing to be sent this spring."

The Entry Court consists of an elegantly paved circular area with a central island of trees and herbaceous plantings. The spacious court will provide room for trams to drop off and receive passengers, as well as for visitors to assemble and map their visit to the Kemper Center. Shaded benches, interspersed with containers of colorful annuals and placed against a backdrop of flowering shrubs, will provide a space in which to linger and rest.

RENDERINGS BY MARTY COULTER

"The members' welcome, through their support of the Entry Court, is the finest gesture we can extend to visitors to the Kemper Center. We are deeply grateful to the Members' Board for their ingenuity in developing this plan and for their generous support through their leadership gifts," commented Peter Raven.

Concluded Mrs. Tschudy, "An important part of our plan -- and the most fun and exciting part -- is to recognize the participation of all members joining us in this project. We are working now on designing a small, permanent kiosk for the education building that will be linked to the Kemper Center's computer system, so that we can enter the names of contributors as we receive their sponsorship gifts. Members will be able to locate their names in the list at any time, and they can enroll their relatives and friends as sponsors as well!"

Donors are still needed for these Gardens

Ornamental Vegetable and Flower Garden
Borders combine annuals, perennials, and vegetables in unusual and colorful ways. Especially useful for gardens with limited space. Displays surround an overlook with a shady arbor that provides a panoramic view of the Demonstration Gardens.

Lath House
A cedar framed enclosure for demonstrations in potting, pruning, flower arranging, container planting, and other horticultural techniques. Includes raised planters for summering houseplants and a display of hanging baskets.

Apple Allée
An elegant brick walkway through the Demonstration Gardens is flanked by matching specimen apple trees surrounded by groundcovers mixed with flowering spring bulbs. The walkway terminates at a circular fountain where six bronze geese play among jets of spraying water.

Groundcover Border
Rich contrasts of color, texture, and form. Plants for sun and shade, plus deciduous, evergreen, and low growing flowering groundcovers are all displayed.

Agronomic Garden
Crops from Missouri, the United States, around the world, and crops of the future. A lath-roofed shelter provides shaded seating, a demonstration area, and a setting for interpretive panels.

Fruit Garden
A wide array of fruit trees and plants suitable for the St. Louis climate. Curving beds display decorative uses of small fruits and various methods for growing strawberries, blackberries, raspberries, and more.

Limestone Glade
Missouri's limestone glades are special habitats characterized by shallow, rapidly draining soils, weathered limestone boulders, and native grasses and wildflowers. Vibrant colors of purple coneflowers, evening primroses, and heliotropes mingle with adder's tongue ferns, Indian paintbrushes, and rare native sunflowers.

Rock Garden
A winding path up a hillside layered with outcrops of Missouri limestone and sandstone boulders. A display of native and ornamental plants includes dwarf conifers, lichens, mosses, low growing deciduous shrubs, perennials, groundcovers, and grasses. Plants from around the world suitable for growing in St. Louis will be included.

Native Shade Garden
A replica of an eastern Missouri woodland features white oaks, sugar maples, and butternut hickory trees, plus dogwoods, sassafras, serviceberries, and spice bushes forming a canopy over paths lined with limestone boulders and shade-loving native wildflowers.

Gardens with donor support

Backyard Garden

Bird Garden

Boxwood Garden

Butterfly Garden

Children's Garden

City Garden

Entry Court

Experimental Garden

Flower Borders

Fragrance Garden

Garden for All

Prairie Garden

Secret Garden

Terrace Garden

Vegetable Garden

Chinese Garden
Celebrating the sister city relationship between St. Louis and Nanjing, the first established between the U.S. and China, a Chinese Garden will be built at the Missouri Botanical Garden in an area adjacent to the Demonstration Gardens. A traditional pavilion, ornamental stone bridges and walls, a pond, and traditional plantings are being developed in close collaboration with colleagues in China. Watch for details of this exciting garden in the May issue of the Bulletin.

YOU & THE ENVIRONMENT

Missouri Botanical Garden Environmental Policy Statement

The mission of the Garden is to discover and share knowledge about plants and their environment, in order to preserve and enrich life. Accomplishing this mission depends on the responsible management and conservation of the world's biodiversity. The quality of human existence depends on an environment that is healthful in all respects. For these reasons, the Garden places major emphasis on educating individuals to take responsibility for the overall quality of the environment. In addition, the Garden promotes public understanding of environmental issues locally, nationally, and internationally.

Particular goals of the Garden's programs are the conservation of biodiversity, sound horticultural practices, international understanding and action, and the responsible use of all resources. The Garden emphasizes these goals in its own activities and encourages individuals and other organizations to do so as well.

Healthy Plants for A Healthy Environment

SOUND HORTICULTURAL PRACTICES involve a common sense approach. The key is understanding the growth requirements of your plants, as healthy plants have a greater resistance to insects and diseases and require less maintenance.

For example, the Garden's living collection of plants emphasizes natural plant communities and attempts to avoid monocultures, as these displays require large amounts of fertilizers and maintenance. We prune carefully to remove sources of disease, avoid overcrowding, and promote good air circulation. We work constantly to improve the quality of our soil; we use raised or mounded planting beds to promote good drainage in wet weather and allow roots to grow deep for protection in seasonal droughts.

Using this common sense approach, the Garden's horticulture staff is able to display an enormous variety of plants and, at the same time, maintain them in an environmentally responsible manner.

Environmental responsibility in horticulture involves six broad categories of environmental concern:

Integrated Pest Management (IPM)

The Garden is a leader among U.S. botanical gardens in the use of IPM. IPM is a multifaceted approach to pest control that involves vigilant monitoring of pest populations, use of biological controls including beneficial insect predators, growing disease-resistant varieties, and minimum use of low-toxicity, highly specific pesticides with low residual effect. Reducing pesticide applications encourages higher populations of natural predators of our most common insect pests, which frequently keeps pest populations at acceptable levels, and today we accept higher levels of pests as part of the environmental balance.

The Garden implemented IPM in its greenhouses and conservatories several years ago, and is working to expand its applications outdoors as well. Recently the Garden offered a ten-week course in IPM for staff and Master Gardeners and presented a workshop on IPM techniques at a conference of the American Association of Botanical Gardens and Arboreta.

Sound Horticultural Practices Make the Smallest Possible Impact on Natural Resources.

Composting, Soil Conservation, and Fertilizer Use

The recent Missouri state law banning lawn waste from landfills has encouraged the use of compost in home gardens. The Garden has taught and promoted composting for years as a means of improving the soil and as an excellent way to recycle plant materials.

Mulch builds soil fertility, reduces erosion, aids weed control, conserves moisture, and protects plants' roots from temperature changes. We fertilize with low doses on a frequent basis or use timed release fertilizers to minimize leaching into ground water. Grass clippings are left in place to add nutrients to turf, and woody material is chipped and re-used as mulch.

This spring the Garden will be expanding its composting facilities with support from a grant from the Missouri Department of Natural Resources and will benefit from the periodic loan of a tub grinder from Top Care Turf Co. for grinding woody plant waste. The Kemper Center will begin teaching vermicomposting, the use of worms in making compost.

Water Conservation

Efficient watering systems are the key to water conservation. Automated watering sytems minimize labor and permit watering at night to reduce evaporation in several of our gardens. However, the Garden presently lacks the resources to install modern landscape irrigation equipment throughout the grounds. Most manual watering is done early in the day using efficient soaker hoses, floor misters, and drip systems wherever possible.

We use supplemental irrigation only when natural rainfall is insufficient. We water outdoor areas deeply once a week rather than doing frequent, shallow watering. We plant drought-resistant tall turf-type fescues rather than less hardy bluegrass or other varieties and use mulch on all exposed soil to minimize water loss.

Plant Acquisitions

The Garden is vigilant about the sources of its plants and keeps meticulous computerized records of all plants in the living collection. We exercise great care that wild collected plants do not threaten natural populations and we do not accept illegally collected plants. We purchase only from reputable seed producers and growers, accepting only nursery-propagated native plants, and a high priority is given to obtaining species of known nativity.

Enhancing Biodiversity and Wildlife Habitat

The Garden is a participating institution of the Center for Plant Conservation and keeps species in the CPC National Collection under propagation here. The Horticulture Division gives

continued on next page

Trustees Hold Annual Meeting

Trustees Sydney Shoenberg and Tom K. Smith Honored for Service to the Garden

AT THE ANNUAL MEETING on Wednesday, January 26, 1994, the Board of Trustees paid tribute to two Trustees for their years of service to the Garden. President John K. Wallace, Jr. presented the special new Missouri Botanical Garden Service Award to Trustees Tom K. Smith, Jr., and Sydney M. Shoenberg, in recognition of their leadership through the years.

Mr. Smith was recognized for 25 years of continuous service. He first joined the Board for a brief period in 1963; following a short departure from St. Louis, he rejoined the Board in 1967 and was elected president in 1975. During his presidency, the Garden opened the English Woodland Garden, the Japanese Garden, and began construction of the Ridgway Center. He became an Emeritus Trustee in 1988.

Sydney Shoenberg has served on the Board of Trustees for 22 years. He has given enormous amounts of his time and energy in service to the Garden and has been a tireless proponent of this institution as a key element in the cultural life of St. Louis. The generosity of Mr. Shoenberg, his family, and the Shoenberg Foundation has supported or made possible a number of major features at the Garden, including the Ridgway Center, the Shoenberg Auditorium, the Shoenberg Fountain, the Shoenberg Conservation Center in the Garden's library, and the award-winning Shoenberg Temperate House.

A number of Trustees have given decades of service to the Garden. They will be honored at future meetings of the Board. Also at the annual meeting, the Trustees elected three new term Trustees, the Reverend Earl E. Nance, Jr., June Kummer, and John W. McClure. Roma Wittcoff was elected as a new Emeritus Trustee. Board members Samuel B. Hayes III and M. Peter Fischer were named Life Trustees; Marilyn Fox and Carolyn Losos were reelected as term Trustees; and Robert E. Kresko, Dr. Helen E. Nash, and William E. Maritz became Emeritus Trustees.

RICHARD BENKOF

Pictured: John Wallace, president of the Board of Trustees (left) presents service awards to Sydney Shoenberg (center) and Tom K. Smith.

HEALTHY PLANTS continued

priority to enhancing the genetic diversity of all of its plant collections. Displays and interpretive signs highlight the importance of biodiversity in our landscapes. The new Demonstration Gardens of the Kemper Center for Home Gardening will include hardy native plants and gardens specifically planned to attract birds and butterflies. The Arboretum places the highest priority on preserving wildlife habitat and restoring native plant communities, exemplified in the wetlands project and the new Whitmire Wildflower Garden. Our decreasing reliance on long acting pesticides will continue to permit ever-increasing numbers of insects and animals to live our landscape.

Energy-Scaping

The Kemper Center teaches homeowners to plant deciduous trees to shade the house in summer and let sunlight through in winter; hedges can serve as windbreaks and beds of groundcovers can help to reduce heat reflected from paved areas. All buildings at the Garden are landscaped with these principles in mind.

Sound horticultural practices address our environmental concerns by making the smallest possible impact on our resources while working to maintain or restore a natural ecological balance. The Horticulture Division at the Garden will continue working to provide leadership in these concerns. ■

RICHARD BENKOF

The Tree That Refused To Die

THE GARDEN is no stranger to environmental problems. In the 1930s, smoke from soft coal burned in most homes and industries made St. Louis so dark that streetlights had to be turned on at noon. Before a smoke abatement ordinance was enacted in 1940, the oily black coal smoke had killed all of the conifers at the Garden—except one. The white pine by the Desert House survived and today it still provides sustenance for the yellow-bellied sapsuckers that drill the hundreds of tiny holes in its trunk. Some tree!

MISSOURI BOTANICAL GARDEN ARCHIVES

Fashion & Function

The Evolution of Tower Grove House

By Judith Smith

Would you pay $9,352 for a fine, large two-bedroom home, with a servants' wing, designed by a prominent architect? That's what Henry Shaw paid for the construction of Tower Grove House in 1849.

When Shaw built Tower Grove House, he intended it to be his summer home, complementing his elegant town home at Seventh and Locust. Architect George I. Barnett chose the Italianate style for Tower Grove House. This style, inspired by villas on Lake Como in Italy, was popular for country homes in England.

When it was first built, Tower Grove House looked much different from the home we see today. The east wing was set back and consisted of three stories of low-ceilinged servants' quarters. The west wing included all of Mr. Shaw's living quarters.

After Mr. Shaw's death in 1889, the Garden's next director, Dr. William Trelease, was to move into the house with his wife and two sons. With only two bedrooms and no indoor plumbing, however, the house was not sufficient for a family. The Garden Trustees decided that a complete remodeling was in order, and in 1891 the servants' wing was replaced with the two-story wing we see today, at a cost of $19,000. This more than doubled the family living space. Among the added rooms were three more bedrooms, the residence's first indoor bathroom, a more modern kitchen, and a formal dining room.

The exterior surface of the house evolved through the years, as well. The exterior is brick, and at first was painted a light color. When the new east wing was added, the contractor painted the entire house red, to minimize the differences between the older and newer construction. It wasn't until 1918 that the exterior took on its current appearance. In that year, stucco was applied over the brick. ■

continued on next page

Judith Smith is a former tour guide for Tower Grove House.

MISSOURI BOTANICAL GARDEN ARCHIVES

Tower Grove House, Then and Now:

Above are two views of the House in 1890, before the east wing was enlarged.

A modern view of the House, above left, shows how dramatically the proportions of the mansion have changed.

Tower Grove House *continued*

Historical Committee

The restoration of Tower Grove House has been ongoing for 40 years, under the supervision and support of the Tower Grove House Historical Committee. Restoration on the House was underway by 1954, and the Historical Committee was formally established by the Board of Trustees in April, 1959, to promote the restoration work and raise funds. In the late 1970s the Tower Grove House Auxiliary was established for the purpose of raising money to support the House; today the Auxiliary sponsors the Victorian Christmas decorations, the Candlelight Tour, and the TeaRoom luncheons.

Jean Crowder Honored

Tower Grove House has received a generous donation from Su-Ellen Viscuso in honor of Jean Crowder, the current president of Tower Grove House Auxiliary. Jean has been a member of the Auxiliary since its inception; prior to that she served as a tour guide at the House. She also serves on the Garden Members Board and is currently the coordinator of the Membership Services Desk.

AIA Award to Conservation Center

The Emerson Electric Co. Conservation Center received a merit award at the annual St. Louis American Institute of Architects/Construction Products Council awards dinner September 15, 1993. The awards recognize outstanding achievements in architecture and seek to increase awareness of excellence in design and craftsmanship. Mackey Mitchell Associates of St. Louis were the architects for the building, which was dedicated at the Garden last spring.

MISSOURI BOTANICAL GARDEN ARCHIVES

The late Paul Kohl, dean of the Garden's Horticulture Division, instructs the first group of Garden Guides in January 1969.

Garden Guides' Silver Anniversary Year

25 Years of Teaching Visitors about the Garden

IN 1993-94 the Garden Guides observe their silver anniversary year. The docent group was organized in 1968 by Ken Peck, then head of the Education Division, with help from the Friends of the Garden, as the Members' Board was called at that time. Mr. Peck and colleagues trained the first group of 25 women to give tours of the Garden. In the early years the Guides gave tours only to schoolchildren, but today they lecture to visitors of all ages and interests, on topics from horticulture to trees to sculpture to architecture to natural science. Today the Guides number 74 men and women, who gave 5,331 hours of service to the Garden in 1993.

The Garden Guides are among the hardest working and best-informed people at the Garden. In addition to their tour duties, Guides take intensive enrichment courses to keep up to date on current information about the Garden. They administer their own organization, train new docents, do research, host exhibitions, and make each visitor's trip to the Garden an unforgettable experience.

In 1993 the Guides expanded their free 1 p.m. walking tours for the public from three days a week to a daily schedule, March through November. They served 16,345 children and adults during the year.

CLIFF WILLIS

RICHARD BENKOF

Above: Garden Guide Mary Jane Kirtz leads a group on a tour of the Garden's sculpture collection.
Right: Guide Maurita Stueck with a class of high school students in the Desert House.

SMALL FRUITS: AN EDIBLE LANDSCAPE

The Demonstration Fruit Garden

One of the 23 gardens to be installed at the Center for Home Gardening is the Fruit Garden, which will display small fruits and fruit bearing trees. Featuring a wide assortment of fruits and techniques for growing them, this garden is sure to pique the interest of the backyard gardener who has always wanted to enjoy luscious home-ripened fruits. An"edible landscape" can be both functional and attractive, with maintenance requirements similar to other ornamentals.

Choosing a Fruit Crop

Finding the best selections for Missouri's climate is made easier by the extensive testing done by our University Extension system. The most dependable selections can withstand the low temperatures typical of our winters, as cold injury from late spring frosts is the leading cause of problems with small fruits.

The easiest small fruits to grow here include grapes, raspberries, some blackberries, and strawberries. Highbush blueberries are becoming more popular but require exacting soil conditions. If properly cared for, they offer not only fruit, but beautiful fall color as a landscape planting. Generally, gooseberries are not well adapted to central and southern Missouri, but they seem to do better in the upper parts of the state without special care.

Site Selection

Recognize that once plants are in the ground, mistakes cannot be easily corrected. Locate the planting in full sun and as close to the house as possible, so you can keep tabs on pests and diseases as well as water conditions. Avoid low or sheltered sites, as cold air will settle there, making frost damage more likely. An exposure with full sun on a slight slope is ideal.

A convenient source of water is also important. Summer in St. Louis can be quite dry and hot, making supplemental water necessary for a top quality crop. Water is most important during the period when the fruit is developing. Water may be supplied with sprinklers, soaker hoses, or a trickle "drip" system.

Too much water is just as bad as too little. Poorly drained soils often lead to problems with sensitive crops like blueberries and raspberries. As you prepare the soil, check the drainage by digging a one-foot deep hole and fill it with water. If water is still in the bottom of the hole 24 hours later, you need to choose another spot or do some extra work to penetrate the hardpan.

Site Preparation

Soil preparation is the most important factor for successful small fruit crops. It should be done a year ahead, or at the very least in the fall before planting. Soils need to settle so that plantings remain at the proper depth and the crowns don't sink. Cane-type fruit crops such as blackberries and raspberries will eventually develop a root system two feet deep; this is the depth of a properly prepared site.

Tillers will not reach a two-foot depth, so you must double dig the planting area. Double digging requires removing the top foot of soil, laying it aside, and then digging down another foot. Add organic matter in the form of compost, leaf mold, or peat moss. This will loosen clay soils; about two bushels per square yard will be sufficient. Till the surface and you are ready to plant.

Planting a green manure crop in the fall will help to settle the newly tilled soil and provide some erosion control through the winter. Manure crops are sown, grown, and plowed under in the spring. Oats and annual rye are good fall cover crops to be planted in the first part of October.

In the spring, do a soil test to determine adequate levels of nutrients. The Center for Home Gardening will process samples for you for a small fee. Nitrogen levels should be kept minimal in the first year. For most crops, this is the most important time for establishing the planting. Use a complete fertilizer containing nitrogen, phosphorous, and potassium depending on your soil test. Plowing the cover crop under will also add some nutrients, but the value of a cover crop is largely in the organic matter it adds to the soil.

Don't expect to harvest a significant crop until the second or third season. Everbearing raspberries and dayneutral strawberries are the exceptions, bearing small crops the first year. In the second and third years, fertilizer rates will change depending upon the crop and whether you are working rows or a square area. The Center for Home Gardening can assist you when the time comes.

Strawberries

Strawberries are a durable crop that make an attractive border planting. You can choose from three different types including junebearing, everbearing and dayneutral.

Junebearing strawberries yield a crop the year following planting. In the first year, blossoms are removed so that the plants willdirect most of their energy into establishing themselves. Runners fill in the rows, producing new plants. Harvest in the second year is from late May through June. The planting should continue to be productive for four to five years. Good cultivars for this area are Earliglow, Redchief, Surecrop, and Cardinal.

Everbearing strawberries will produce a crop in the fall of the first year and in both the spring and the fall each year thereafter. The first year's spring blossoms should be removed, allowing late summer blossoms to produce the first crop. These strawberries can be planted in containers and should be protected from heat in mid-summer. The best cultivar is Ozark Beauty.

Dayneutral strawberries require different cultural conditions. These berries will produce fruit throughout the season when daytime temperatures are below 85 degrees F. Plants are usually kept for two years, then replaced with new ones. Tribute and Tristar are good cultivars for this area .

Raspberries and Blackberries

Bramble crops do well in our area but need to be carefully pruned to keep plants productive and in bounds. Deep, well-drained, organic soils are crucial.

While the root systems and

crowns live year after year, the canes live only two years. The first year canes are called primocanes and do not produce fruit. Second year canes are called floricanes and produce flowers, set fruit, then die out. After harvest, floricanes are removed to allow room for the primocanes to develop into floricanes.

Fall or everbearing raspberries present an exception to the above because they can produce fruit on first year canes in late summer and early fall. They will continue to bear fruit in the next year before dying out. Overall, it is easier to manage the everbearing raspberries for a fall-bearing crop, cutting out all canes which produced fruit one year and keeping three to four canes per plant for the next season. Good summer bearing raspberries include Southland, Latham and Royalty. Everbearing raspberries include Heritage, Ruby Red and Redwing.

Blackberries survive well in St. Louis with protection from winter cold but generally are less hardy than raspberries. There are several types: erect, semi-erect, and trailing. The **erect** blackberries come as either thornless or thorned, are the most reliable, and do not need support. The **thornless** types are considered to be less hardy than thorny but they are a pleasure when it comes time to pick! **Trailing** forms are thornless, require support, and are not reliably winter hardy.

Since the minimum winter temperature is the most likely factor to limit blackberry production, location on a sunny slope is ideal.

Gardeners frequently complain about blackberries getting out of control. Pruning several times during the summer is critical to managing the plants. A six-foot wire trellis will help. New canes should be cut back to four feet high to promote side branching several times during the season. Erect, thorny cultivars for this area include Cherokee, Illini Hardy and Darrow. Recommended thornless cultivars are Navaho and Chester.

Blueberries

The biggest challenge to raising blueberries is getting the soil conditions right at the very beginning. Blueberries require a more perfectly drained site than any other small fruit, not too wet or too dry. Work organic matter into the soil to improve drainage, and be sure to mulch to guard against winter kill.

Equally important, blueberries require an acid soil, pH 4.8 - 5.5. Soils that start out above 6.0 are hard to adjust sufficiently to raise blueberries. If your soil is too alkaline, it might be easier to construct a raised bed and completely manage the soil from the beginning. Typically, sulfur needs to be added to the site at least a season before planting in order to effectively acidify the soil. Soil testing should be done to adjust the amount of sulfur applied, then repeat the application each season to maintain the desired pH range, following a soil test check. Adding peat moss to the planting hole will help to maintain an acid condition.

Blueberries generally do not have insect and disease problems. Birds, however, can be a problem, and the most effective control is netting. Blueberries blossom in April but are not generally affected by late spring frosts. Planting two cultivars is recommended to assist with pollination, but it is not absolutely necessary for a good crop. Cultivars recommended for our area are Earliblue, Bluecrop, and Jersey.

Grapes

Many homeowners are getting the urge to grow grapes for wines, preserves, and for the table. American and French-American hybrid grapes are recommended in this area. European grapes require an extended growing season with winter rains and are not generally hardy.

Choosing which grape to plant depends upon what it will be used for. The seeded American Concord grape is the standard for juice, jelly and jams. Seedless American grapes are good for fresh eating, with Himrod and Reliance as popular choices. Wine can be made from any grape. French-American hybrids, though less hardy, can be grown here. Recommended varieties would include Seyval Blanc and Vignoles.

Controlling pests, diseases, and birds is a challenge for every grape grower. Trellis supports are necessary to keep the planting open, guard against disease and maximize production.

--Dr. Steven D. Cline,
Manager, Kemper Center for Home Gardening

The Kemper Center for Home Gardening is open 10 a.m. to 4 p.m. daily.

The Plant Doctor is available 10 a.m. to noon and 1 to 3 p.m. Monday through Saturday.

Admission to the Kemper Center is free with regular Garden admission. For information on classes and activities at the Center, please refer to the Adult Education brochure mailed to all members, or call 577-9440.

TELEPHONE HELP

The Garden has several telephone services available to assist you.

GardenLine **577-9400**
24-hour recorded information about Garden events, hours, admission and directions. Outside area code 314, call **1-800-642-8842** toll free, 24 hours a day.

Horticultural Answer Service (314)577-5143
Monday through Saturday, 9:00 a.m. to noon. Master Gardeners are on hand to answer your gardening questions. The Answer Service does not have Saturday hours November through February.

HortLine **(314) 776-5522**
24-hour recorded gardening information is available with a touch tone telephone. You will need a brochure listing the hundreds of HortLine topics in order to use the service; you may request a brochure by calling the Kemper Center for Home Gardening at (314) 577-9440, 10 a.m. to 4 p.m. daily. **Plants in Bloom at the Garden** is updated weekly. Press 3 when you call HortLine.

Master Composter Hotline (314) 577-9555
9 a.m. to noon, Monday through Friday. Specially trained Master Gardeners are on hand to answer your questions about yard waste management techniques. After hours leave a message and your call will be returned. The Master Composter program is supported by the Monsanto Fund.

Calendar

four tuesdays in march

Gardening by Design

Join noted experts for a look at the best in landscape design and gardening techniques. Tickets are available by subscription for $28/members, $35/non-members. Single tickets are available at the door, only if the series is not sold out: $8.50/members, $10/non-members. Afternon and evening tickets may not be mixed in a subscription. See the brochure mailed to all members, or call (314) 577-5125.

march 12 – april 10 saturday – sunday

Spring Flower Show

9 a.m. to 5 p.m. daily, Orthwein Floral Hall. A New England fishing village is the setting for this year's celebration of the arrival of springtime. Sand dunes, wooded beachfront, sailboats and dockside buildings come alive with a colorful display of coastal plants including dogwoods, azaleas, ornamental grasses, freesias, irises, tulips, grape hyacinths, columbines, astilbes, primulas, nasturtiums, and more. Free with Garden admission.

march 1 tuesday

Gardening by Design: "Basics of Garden Design"

1 and 7 p.m., Shoenberg Auditorium. Todd Steadman, former senior garden editor for Southern Living magazine and now head of his own landscape architecture firm, discusses how to prepare a master plan for every garden. *See highlight.*

march 6 sunday

Kathryn Hopkins Exhibit

9 a.m. to 5 p.m. daily through April 10, Monsanto Hall, Ridgway Center. Local artist Kathryn Hopkins makes subtle use of papers and objects in her works with a floral and botanical theme. Free with Garden admission.

march 8 tuesday

Gardening by Design: "Garden Gadgetry"

1 and 7 p.m., Shoenberg Auditorium. Steve Dobbs, consumer horticulturist with the Oklahoma Cooperative Extension Service, displays the latest garden gadgets, gizmos, and shortcuts in a lively "hands-on" presentation. *See highlight.*

march 11 friday

Members' Preview: Spring Flower Show

5 to 8 p.m., Ridgway Center. A glimpse of springtime on the quiet coast of New England. Entertainment, cash bar. Dinner buffet available in the Gardenview Restaurant. For members only.

march 15 tuesday

Gardening by Design: "Groundcovers and Vines"

1 and 7 p.m., Shoenberg Auditorium. A look at creative uses of landscape plantings with Allen Lacy, professor of philosophy and a popular garden writer for The New York Times, editor of The American Gardener, and author of The Garden in Autumn, Home Ground, and Farther Afield. *See highlight.*

march 17 thursday

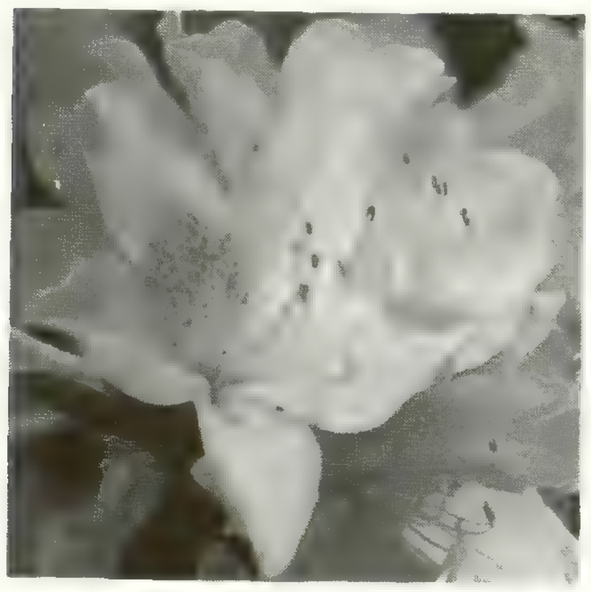
Lecture: "Life in the Forest Canopy: Explorations of the Last Biotic Frontier"

The Jane and Whitney Harris Lecture Series, presented at the St. Louis Science Center by the International Center for Tropical Ecology at the University of Missouri-St. Louis and the St. Louis Science Center. Featuring Dr. Nalini Nadkarni of The Evergreen State College and former director of research at The Marie Selby Botanical Gardens. 7:30 p.m.: a showing of the film *Tropical Rainforest* in the OMNIMAX Theater; 8:15 p.m.: a lecture by Dr. Nadkarni, followed by a reception. Call the Office of University Relations, UMSL, 553-5442 for ticket prices, information, and reservations.

march 22 tuesday

Gardening by Design: "Wildflowers in Your Garden"

1 and 7 p.m., Shoenberg Auditorium. Join Viki Ferreniea, former director of horticulture for the New England Wildflower Society and one of America's foremost wildflower experts, for recommendations on creating and maintaining wildflowers in your own garden. *See highlight.*



april 16 & 17

saturday & sunday

Bonsai Show

9 a.m. to 5 p.m., Ridgway Center. The Bonsai Society of Greater St. Louis holds its popular annual display. Free with Garden admission.

april 21 – 24

thursday – sunday

Spring Plant Sale

9 a.m. to 6 p.m., Thursday and Friday; 9 a.m. to 5 p.m., Saturday and Sunday; Garden Gate Shop and Orthwein Floral Hall. Members receive a 20% discount on all gifts and plants, all four days. See page 15.

april 24 sunday

Chinese Celebration

11 a.m. to 4 p.m., Ridgway Center. The second annual celebration of Chinese culture at the Garden, a colorful introduction to Chinese music, arts and crafts, and cuisine. Free with Garden admission.

april 30 & may 1

saturday & sunday

Garden Club Flower Show

1 to 5 p.m. Saturday; 10 a.m. to 5 p.m., Sunday, Orthwein Floral Hall. The East Central District of Federated Garden Clubs of Missouri host a juried show with exhibits in flower arranging design and horticulture. Free with Garden admission.

Members' Days

march 16 wednesday ***"For the Birds"***

7 p.m., Shoenberg Auditorium. Bob and Rita Whitcomb, owners of Wild Birds Unlimited of Kirkwood, will show and tell you what to do in your yard to help attract our little feathered friends. Seating is limited. Drawing for a gift certificate from Creve Coeur Botanicals. Free, for members only.

april 28 thursday ***Specialty Garden Tours***

1 to 4 p.m., continuous tours. Visit our specialty gardens for flowering bulbs, rock plants, and rhododendrons, and talk with the horticultural staff and Master Gardeners who are experts in caring for these displays. Meet in Monsanto Hall, Ridgway Center. Attendance drawing. Free, for members only.

every day

Free Walking Tours

1 p.m. daily. Meet the Garden Guides at the Ridgway Center ticket counter, rain or shine, for a fascinating tour of the Garden. Free with regular admission.

wednesdays & saturdays

Garden Walkers' Breakfast

7 a.m., grounds. In cooperation with the American Heart Association, the grounds open early every Wednesday and Saturday morning to encourage fitness walking. Greenhouses open at 9 a.m. Breakfast is available for purchase in the Gardenview Restaurant, 7 to 10:30 a.m. Admission is free on Wednesdays and Saturdays until noon.

continuing

Ecology of U.S. Agriculture: Past, Present, and Future

9 a.m. to 5 p.m. daily, Brookings Interpretive Center. A pictorial history of American agriculture demonstrates the role of agriculture in the environment, using visual displays, computers, and hands-on activities. Problems, solutions, and future challenges are presented. Developed jointly by the University of Missouri College of Agriculture, Food and Natural Resources, University Extension, and the Garden. Free with Garden admission.

RICHARD BENKOF

New officers, shown from left: Herb Jones, Ann Bowen, Mike Cole, Jane Tschudy, Marcia Trulaske, Margie Jaffe.

New Officers and Members Are Elected to Board

AT THE ANNUAL MEETING of the Garden's Members' Board, held January 24, 1994, at Spink Pavilion, new officers were elected. The Board also paid tribute to Mary Longrais, who has served as president for the past two years.

The new officers are: Jane Tschudy, president; Ann Bowen, first vice president; Herb Jones, second vice president; Mike Cole, treasurer; Marcia Trulaske, corresponding secretary; Margie Jaffe, recording secretary.

New members elected to serve on the Board are: Jill Dowd, Barbara English, Mary Fox, Terrie Hogan, Mary Phelan, Julie Schnuck, Ginny Senkosky, and Glee Stanley.

Trustees Honor Mary Longrais

MRS. ANTONIO I. LONGRAIS, who completed a two-year term as president of the Members' Board in January, was honored by the Board of Trustees at their annual meeting on January 26, 1994. During Mrs. Longrais' tenure the 30,000th family member joined the Garden. The Board inaugurated two new events, the Best of Missouri Market and the Missouri Country Affair, and held the fourth Garden Tour attended by 1,500 Garden members and guests. John Wallace, president of the Board of Trustees, said, "Mary's term has been wonderfully productive. She brought to the post a great sense of commitment and a willingness to work with Board members and staff to produce memorable members' events. Her gracious manner and warm personality endeared us to members and visitors alike. We thank her and her husband Tony for their enthusiastic participation and service."

RICHARD BENKOF

Mary Longrais receives a framed botanical print from John Wallace in recognition of her service as president of the Members' Board.

1994 MEMBERS' TRAVEL PROGRAM

The Gardens of Wales

May 14 -- 22, 1994

A SCENIC TOUR of the gardens, castles, homes, and ancient archeological sites of Wales. Stay at historic Bodysgallen Hall, with visits to the splendid gardens of LLewesog, Bodnant, Bryn Bras Castle, Foxbrush, Plas Newyydd, and Caernnarfon Castle. Special lectures will be given by Nigel Brown, curator of the Trebarth Botanic Garden at Bangor; Maldwyn Thomas of the BBC; and Michael Senior, garden historian. A visit to the Celtic and Druid Gallery on the Isle of Anglesey will include a lecture by a Druid archaeologist and a tour of his gardens. The tour visits Powis Castle, Whitton Hall, Llsdinam, Great Campston, Lower House Farm, Penpergwyn Lodge, and the Neuadd, home of *Hortus*, the international garden journal. At several stops the group will be entertained by the owners of the historic gardens.

For complete information on this exciting travel adventure, please call Brenda Banjak at (314) 577-9517.

Mother's Day Luncheon Is May 6

MARK YOUR CALENDARS TODAY for the popular Mother's Day Luncheon at the Garden! Reservations for the gala luncheon party are $40 per person for members and $50 for non-members. Watch your mail for a special invitation in April, or make your reservation by calling (314) 577-9500.

Reciprocal Admissions

ONE OF THE MOST welcome benefits of your Garden membership is a program offering free admission and additional benefits at over 100 botanical gardens, arboreta, and conservatories throughout North America. To obtain the benefits of this program, administered by the American Horticultural Society, just present your Garden membership card at any participating institution. The list of institutions is too lengthly to list here, but you can obtain a brochure by calling the Membership Office, (314) 577-9500.

GARDEN GATE SHOP

Easter Is April 3

EASTER IS EARLY this year, so get ready for spring with colorful blooming plants, baskets, lovely Easter decorations, and distinctive gifts. The Shop is featuring the new Missouri Botanical Garden boxed notecards featuring color photographs of the Garden by Jack Jennings. These are perfect for Mother's Day, coming up on Sunday, May 8.

Spring Plant Sale

Members' Pre-sale:

Thursday, April 21 & Friday, April 22: 9 a.m. to 6 p.m.

Sale opens to the public:

Saturday, April 23 & Sunday, April 24, 9 a.m. to 5 p.m.

VISIT THE ORTHWEIN FLORAL HALL for the latest selections in herbs, perennials, annuals, roses, azaleas, and bulbs. In the Garden Gate Shop look for new and exciting gifts and gardening items for spring and summer. Members receive 20 percent off all merchandise, all four days.

GARDEN TO BE PART OF A UNIQUE COLLABORATIVE PROJECT

Cures from the Rain Forest of Suriname

THE PLANTS OF SURINAME will be collected and studied for their medicinal value, with the aim of developing new drugs, by the Missouri Botanical Garden in cooperation with Virginia Polytechnic Institute and State University, Conservation International, Bedrijf Geneesmiddelen Voorziening Suriname (BGVS), and Bristol-Meyers, Squibb. The five-year project is funded by a unique new collaborative government program of the U.S. Agency for International Development, the National Institutes of Health and the National Science Foundation. The program, known as the International Cooperative Biodiversity Groups (ICBG) program, awarded this group approximately $2.5 million over the next five years. Four other groups also received $2.5 million, five-year awards.

The overall objective is to stimulate biodiversity conservation in Suriname by demonstrating the value of biodiversity to the country and its people. The five organizations involved will each contribute expertise to carry out a program of examining potential medicinal agents from Suriname's rain forest and will initiate a program of educational and extension activities in the country, located on the northeast coast of South America.

The project allows researchers an unusual opportunity to compare the yield of "random" collecting of plants for medicinal value with collecting plants traditionally used medicinally by indigenous peoples. Ecological study plots in different life zones will be established by MBG and Conservation International botanists; all the plants of these plots will be collected and screened. Conservation International will interview traditional healers in the same plots to pinpoint the plants they have used in order to determine what percentage of species from the plot area are used ethnomedically.

Using both methods of collecting in the same plot areas should prove valuable in helping scientists worldwide examine the rationale for selection of plant material as a potential source of new medicines.

Other aspects of the project include training of Surinamese botanists, conservationists and chemists, plus efforts to ensure that ethnobotanical knowledge is passed on to the younger generation. Strengthening the conservation ethic locally will help Surinamers manage their natural resources more efficiently. The ICBG collaborators will also search for non-medicinal forest products which can be brought to market in the short term to augment the economic value of the intact forest as soon as possible.

"We are very excited about this project," said Dr. Henk van der Werff, head of the Garden's Floristics Department and MBG coordinator of the ICBG. "It allows us to accomplish four important goals: to study biodiversity and its conservation, to screen plant species for potential medicinal compounds, and to help the infrastructure of Suriname."

New Genus and Species of Tree Links Latin America to Africa

SCIENTISTS have identified a new genus and species of tree in Costa Rica in a plant family that was previously thought to contain just one genus and species from Africa, according to a paper in *Novon*, the journal for botanical nomenclature published by the Missouri Botanical Garden.

Ruptiliocarpon, which grows in Costa Rica and northern South America, had previously been placed by botanists in both the bean and mahogany families. With the publication of the article, *Ruptiliocarpon* is placed in the family Lepidobotryacaeae, whose only other genus, *Lepidobotrys*, grows in Africa.

While both genera have been classified in various existing families during their nomenclatural histories, each was considered distinct enough to have had its own family created to accommodate it. Now, with the discovery of *Ruptiliocarpon* and its remarkable similarity to the African *Lepidobotrys* both are being placed in Lepidobotryacaeae, the family created in 1950 for *Lepidobotrys*.

The discovery of the relationship between these two groups of plants has led Garden scientists and associates to conclude that *Ruptiliocarpon* and *Lepidobotrys* have descended from an ancestor that was probably present in both Africa and South America when the two continents were much closer together, between 100 and 50 million years ago. The affinities between these plants add evidence to the theory that the flora of the American tropics and that of Africa shared a common origin on a great continent, Gondwanaland, which broke up to become, in part, South America and Africa.

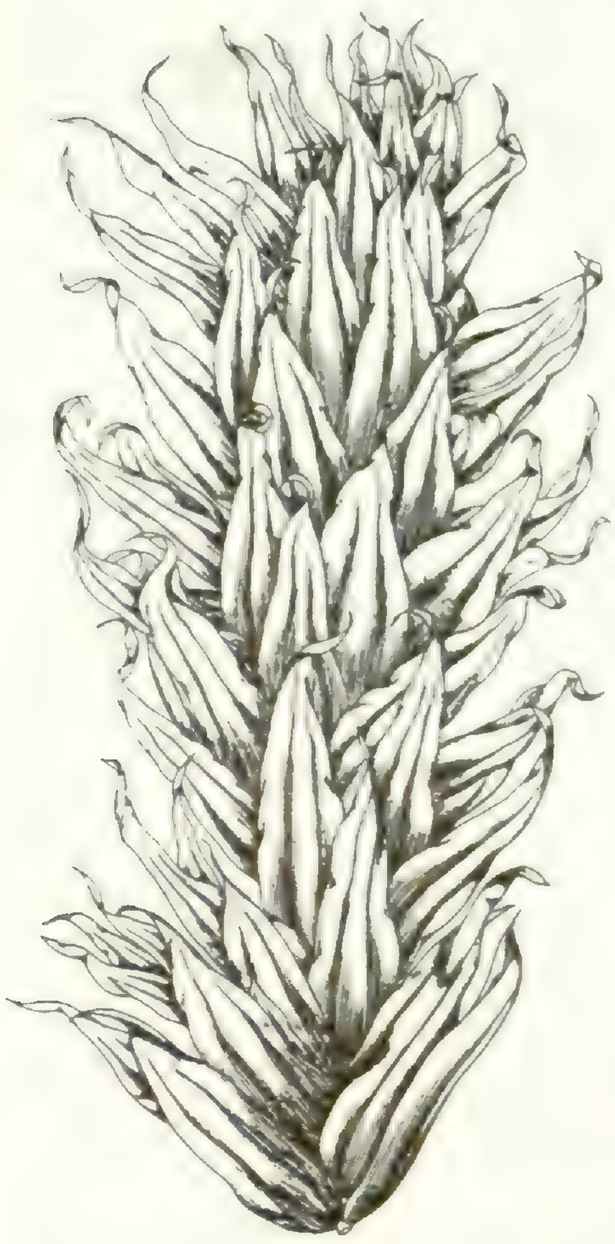
So far, *Ruptiliocarpon* is represented by only one species. Botanists Barry Hammel of the Garden and Nelson A. Zamora of the Universidad Nacional Autonoma and the Instituto Nacional de Biodiverisidad of Costa Rica, the authors of the article, have named that species *Ruptiliocarpon caracolito*. Collections from South America have come to light since the genus' discovery in Costa Rica; they await further study and are likely to be described as another new species within the genus.

Ongoing investigations on an extract of the bark of *Ruptiliocarpon caracolito* show promise as a natural pesticide. "The novelty, problematic placement, and economic potential of *Ruptiliocarpon* underscore the urgency of continued exploration, study, and protection of tropical flora," wrote Hammel and Zamora.

Bryology

The Garden's collection of these tiny plants is one of the largest in the U.S.

by Robert Magill, Ph.D., Curator, Missouri Botanical Garden



WHAT IS BRYOLOGY? Bryology is the study of bryophytes, the plants commonly called mosses, liverworts, and hornworts. Bryophytes are plants that have specialized in being small. Like all plants they are green and therefore, unlike fungi, produce their own food. Mosses, like ferns, produce spores for reproduction rather than seed and so are thought to be more primitive than flowering plants.

It is estimated there are about 10,000 moss species that are about equally distributed between the tropical and temperate areas of the world. They are a component in every natural forest and bog ecosystem. The world's oceans are the only major habitat in which mosses do not occur; there are, however, a few mosses adapted to living within the ocean spray-zone. The commonly accepted notion that mosses grow in areas around waterfalls and streams is correct, but is only part of the truth. Mosses can be found in most habitats occupied by plants, from the hot deserts of North America, Africa, and Australia to the frigid zones of the Arctic or the Antarctica.

Mosses even grow as green cushions in cracks on the sidewalks of St. Louis and can be found on trees or in lawns and flower beds in your own garden. They are not aggressive plants and cannot, as is sometimes suggested, displace flowering plants or lawn grasses. They will colonize shaded, slightly acid, damp areas in lawns that are not optimum areas for the growth of grasses, but an application of fertilizer or bone meal will generally result in their decline.

Although mosses are a small part of the flora in the St. Louis area, they can be a dominant element in some tropical ecosystems or wet temperate forests such as those of the Pacific Northwestern United States. Mosses perform a vital function in their ecosystem by absorbing and holding massive amounts of water. In this way, mosses contribute to a healthy environment as part of intact forests; on the other hand, when forests have been degraded, unprotected soil is unable to hold the precipitation, resulting in aggravated erosion which muddies rivers and streams. Moss cushions also serve as collection points for wind-blown soil and seeds thus forming a natural nursery for forest plants. In forests, mosses provide homes for many insects, fungi, and micro-organisms that aid in the production of humus. Mosses are also frequently used as nesting material by small birds and mammals. The great northern bogs, the source of peat moss, have been formed through the millennia by the growth mosses, especially *Sphagnum*, throughout wetlands and moors.

The study of mosses at the Garden is centered around a collection of over 250,000 bryophyte specimens, one of the richest in the world. The collection includes specimens from throughout the world, some from the early 18th century which were obtained with the Benhardi collection, purchased by George Englemann for Henry Shaw in 1857. Recent collections by Garden staff have come from Chile, China, Comoros Islands, the Russian Far East, and Honduras. This large collection helps the Garden's bryological staff to better understand the distribution of mosses around the world, the morphological variations exhibited by distant populations of the same species, and the relationships between and within remote continental floras.

The collection is currently housed on the second and third floors of the Administration Building - the southern extension of Henry Shaw's Town House. The collection is kept in four- by six- inch packets filed upright in index card cabinets. This method of specimen housing is innovative and has been adopted by several other herbaria. In addition to effectively compacting the collections, this filing method also results in substantial financial savings over traditional storage procedures in which specimen packets are mounted on standard herbarium sheets and stored in herbarium cabinets.

RICHARD BENKOF

Members of the Bryology Department (from left): Greg Pedano, Bob Magill, He Si, Bruce Allen, Leonardo Mourre, Marshall Crosby. Illustration at left: A closeup of a moss,* Brymela tutezona *Crosby & Allen

Research in bryology at the Garden is varied. Major projects range from "Recent Literature on Mosses," an intensive annotated bibliography of the world's literature dealing with mosses, to world monographs of tropical moss genera. Staff projects include the writing of floras for south temperate Africa, tropical Africa, and Central America, and checklists of Thailand and Chile. The staff also maintains an index to all moss names (MOST) in the Garden's data base (TROPICOS) and has ambitiously begun to use the accumulated information to initiate a global checklist of the world's mosses. The first phase of this important project is now underway.

Bryology Department Staff

Dr. Bruce Allen, associate curator, is working on a moss flora of Central America, revisions of tropical and temperate mosses, and North American floristic studies. He co-authors a bibliographic compilation, *Recent Literature on Mosses,* that collates the world's literature on mosses.

Dr. Marshall Crosby, senior botanist and senior advisor to the director, is coordinating the production of a worldwide checklist of mosses that will contain information of the estimated 10,000 species of mosses. His moss names register project, *Index of Mosses,* continues to catalog new names and nomenclatural changes. He is also coordinating development of the new research facility.

Dr. Robert Magill, curator of bryophytes and head of the Department of Floristics, is working on moss floras for temperate and tropical Africa and revisions of tropical mosses. He contributes to the names register project, *Index of Mosses,* and co-authors the bibliographic compilation, *Recent Literature on Mosses.*

Dr. He Si, postdoctoral researcher, recently completed his dissertation, a revision of the moss genera *Homalia, Pendulothecium* and *Symphyodon.* He is now working on a checklist of Thailand mosses and curating a large collection of Chilean bryophytes recently acquired by the Garden.

Greg Pedano is the herbarium curatorial assistant for the bryophyte collection; **Leonardo Mourre** and **Jamie Parr** are plant mounters who concentrate on the bryophyte collection . They packeted 21,117 specimens in 1994.

A Visit to the Russian Far East

by James Solomon, Ph.D., Curator, Missouri Botanical Garden

DURING SEPTEMBER, 1993, Dr. Robert Magill and I had an exciting opportunity to visit the Institute of Biology and Pedology in Vladivostok, Russia, and to make collections of vascular plants and mosses in southern Primorskiy Territory, the most species-rich portion of the Russian Far East. This expedition was made possible by a grant from the National Geographic Society.

The Russian Far East, particularly the port of Vladivostok, opened to the West in 1992. Much of the region has been closed to non-Russians since the end of World War II. As a result, little is known outside Russia of the flora of this very interesting region. Our expedition was one of the first ever by Western botanists.

Very few plant specimens from the region are found in scientific collections outside of Russia. The nearly 1,400 new collections of vascular plants and mosses that we gathered on our trip will be of great interest to researchers, especially those involved in international floristic projects such as the Flora of North America and the Flora of China. We also gathered and documented seeds from more than 120 species for the Garden's horticultural accession program. The seeds will be grown for horticultural evaluation.

With the help of Dr. Sigizmund Kharkevich and Dr. Vyachaslav Barkalov, both of whom visited the Garden during the past year, and other Russian botanists, we traveled down the coast by boat to the field station of the Far East State Marine Reserve on the Gamov Peninsula and to Kedrovaij Pad' Reserve, near the Chinese border. From there we went to Lazofsky Reserve, where we saw, in addition to many marvelous plants, signs of the presence of Siberian tigers. It's exciting to know these magnificent animals are close at hand, even though they are unseen.

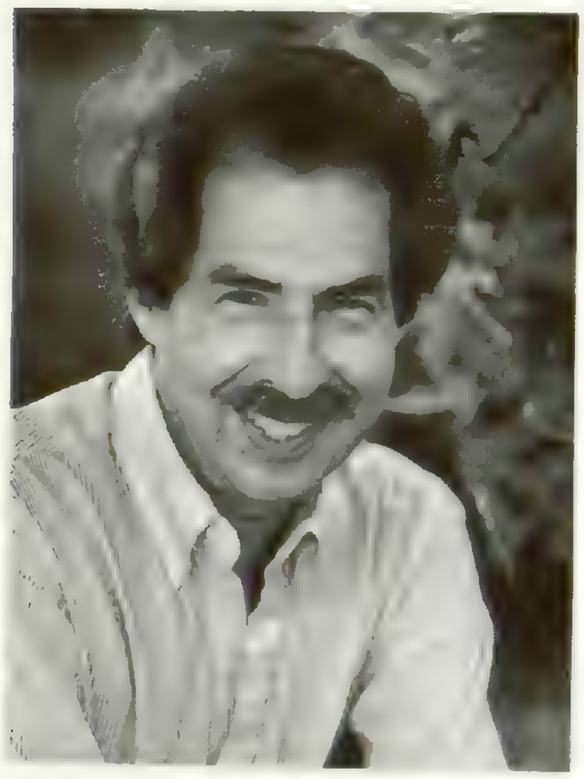
Our visit was one of the first ever by Western botanists.

Another highlight of our trip was climbing Mt. Olkhovaya (1,670 m), one of the highest mountains in the Russian Far East. The summit is covered with a very interesting alpine and sub-alpine flora. According to Dr. Barkalov, we were the first foreigners ever to scale this peak. One result of our expedition was the discovery of a moss, *Meteorium subpolytrichum,* that was previously known only from regions much farther south, in Japan, China, and Korea. Our collection represents the first time the genus and its family have been reported growing in the Russian Far East.

JAMES SOLOMON

Many trees of the region are from genera common to Missouri: maples, oaks, walnuts, ash, pines and firs. Right: Bob Magill fords the Kedrovaya River, Russia.

Martin Schweig Is Named to Botanical Garden Subdistrict Commission



Martin Schweig has been named to serve on the Botanical Garden Subdistrict Commission through December 31, 1994, by Mayor Freeman R. Bosley, Jr. Mr. Schweig replaces the late Homer Sayad as a Commissioner.

Mr. Schweig, a native St. Louisan, is the former director of the Martin Schweig Studio and Gallery in the Central West End. Founded by Schweig's grandfather in 1893, the studio is now operated by his son. Martin Schweig is a distinguished photographer with many awards for artistic achievement and excellence. A graduate of Washington University, he has exhibited at Fontbonne College, First Street Forum, John Burroughs School, and the University of Missouri Center for Metropolitan Studies; he has taught at Washington University, Webster University, and University of Missouri-St. Louis. His work has been widely published and is in the permanent collection of the St. Louis Art Museum and private collections.

In addition to his career as a photographer and teacher, Mr. Schweig has a longstanding commitment to environmental and conservation organizations. He is president of the Animal Protective Association of Missouri and helped to start PetReach, an animal-assisted therapy program that takes dogs and cats to hospitals and facilities for abused children, the aged, and people with disabilities who can benefit from contact with friendly animals. He is a past president of the Committee for Environmental Information and the St. Louis Audubon Society and has served on the boards of Young Audiences and the Saint Louis Zoo Association.

"I have been involved in conservation all my life," Mr. Schweig said. "After World War II the Audubon Society used to hold classes at the Garden, and I would bring eagles and owls to show to children. I love to work in my own garden, but there's always so much more to learn! Maybe someday I'll truly be a gardener."

He continued, "The Garden is one of the outstanding assets of St. Louis. You can enjoy it on so many levels: aesthetic, scientific, horticultural. I visit the Garden often for pleasure, and I'm looking forward to serving on the Commission."

The Subdistrict is comprised of ten members, five each from St. Louis City and County. Commissioners serve as the public body responsible for receiving and disbursing funds acquired through the property tax support approved by voters in 1983.

Sweden Honors Garden Curator with 1993 Dahlgren Prize

Peter Goldblatt, Ph.D., the B.A. Krukoff Curator of African Botany at the Garden, received the 1993 Rolf Dahlgren Prize from the Royal Physiographic Society of Sweden. The award was presented at a formal ceremony held at the University of Lund, Sweden, on December 2, 1993.

The late Rolf Dahlgren, a distinguished Swedish botanist, was a professor of botany at the University of Copenhagen. The prize was established in his memory in the late 1980s and is awarded every three years to honor outstanding achievements in systematic botany. Goldblatt, who is an expert on petaloid monocots and the Iridaceae, or iris family, delivered two lectures in conjunction with the award, at Lund and at Copenhagen.

The Royal Physiographic Society is 220 years old. Linnaeus, the legendary Swedish botanist who founded the modern bionomial system of plant nomenclature, was a member. It has presented awards to distinguished scientists in pharmacology and medicine for many years.

Goldblatt Edits Book on Biology of Africa and South America

A major new volume, Biological Relationships between Africa and South America, has been published by Yale University Press. Edited by Dr. Peter Goldblatt, the book represents the proceedings of the 37th annual Systematics Symposium, held at the Garden October 4-6, 1990.

The Symposium reflected the Garden's longstanding work in tropical botany in both South America and Africa. It brought together leading geologists, biologists, and climatologists to examine the most current research on the striking evolutionary divergence of the flora and fauna of the new and old world tropics that began 100 million years ago, when the landmass called West Gondwana began to separate into two distinct continents, South America and Africa.

"This excellent volume provides the most complete and lucid account of the historical biogiography of West Gondwana," wrote Dr. Peter H. Raven in the Foreward. "We are very proud to have contributed to this important study of evolution," he said.

Center for Plant Conservation Receives Support to Assess Economic Potential of Rare Plants

The Center for Plant Conservation (CPC) has been awarded $35,000 by Philip Morris Companies Inc./Kraft General Foods to continue assessment of the economic potential of American's threatened and endangered plants, working toward the goal of their conservation.

According to the CPC, all U.S. crops have been selected and are derived from natural progenitors. The wild relatives of existing and potential crops represent a fundamental resource for the adaptation and survival of U.S. agriculture, not only for improving today's crops, but in providing for long-term agricultural options.

"We must seriously consider the economic, environmental and societal implications of preserving the genetic base on which current and potential new crops depend," said Dr. Brien A. Meilleur, president of CPC.

Anton Johnson (left), of Philip Morris U.S.A. presents a check to Brien Meilleur.

CLIFF WILLIS

TSIANG YIEN-SI HONORED—The Garden hosted a dinner in honor of Tsiang Yien-si of Taiwan on January 8, 1994. Dr. Tsiang, a distinguished scientist, is secretary-general and senior advisor to the Office of the President of the Republic of China. He was instrumental in establishing the collaborative botanical inventory of Taiwan and was visiting St. Louis to receive an honorary degree from University of Missouri-St. Louis. Shown at the dinner at the Garden are (from left): Garden Trustee William H. T. Bush and Mrs. Bush, Dr. Tsiang, and Ding Mou-shih, representative of Taiwan's Coordinating Council for North American Affairs in the United States.

CLIFF WILLIS

GARDEN SIGNS AGREEMENT WITH VENEZUELA—Francisco Guánchez, President of the Fundación Instituto Botánico de Venezuela (seated, right) signs a cooperative agreement with the Garden's director, Peter H. Raven. This agreement consolidates the existing cooperation of both institutions on the Flora of the Venezuelan Guayana and forsees broader interactions in the future, particularly in the areas of research and community outreach. Standing, from left: Olga Martha Montiel, assistant to the director; W. D. Stevens, director of research; and Paul E. Berry, associate curator.

HENRY SHAW ACADEMY NEWS *Summer Programs*

Summer Science Camp

The Garden's Henry Shaw Academy Summer Science Camp is entering its seventh season. This will be the first summer that classes are taught at a variety of locations, including the Litzsinger Road Ecology Center, Shaw Arboretum, the Missouri Botanical Garden, the Current River, the Meramec River, and local and regional parks. Transportation is provided for all courses.

Ages 4 to 6:

Pitzman Nature Study Classes
June 15 through August 10

Ages 7 to 9:

"Wildlife Are Watching" July 12-13
"Earth Bottles" July 14-15
"The Unseen Garden" July 19-22
"Rain Forest Connections" July 26-29
"Nature's Neighborhoods" August 1-5
"The World Around Us" August 9-12
"Creations from the Earth" August 15-19

Ages 10 to 12:

"Lewis and Clark"
June 21-22 and June 23-24
"Biodiversity and You" July 19-22
"Our Water World" July 26-29
"Inspecta Insecta?" August 2-5
"Prairie Pioneers" August 9-12

Ages 13 to 14:

"Aquatic Ecology" August 16-18

Ages 14 to 17:

"Gardening Apprenticeships"
July 1-15 and July 15-29

Watch for detailed descriptions of the programs in the Henry Shaw Academy Summer Science Camp Brochure, to be mailed in March. For additional information or brochures, call 577-5140. Enroll early as programs fill quickly.

Field Study Programs

Summer is also the time to apply for HSA's exciting year-long field study courses, which start in September. The Stream Ecology Program for 13-14 year olds focuses on water testing, canoeing, and study of Missouri's watersheds. The Explorer Field Study Program for 15-18 year olds offers high school elective biology credit. Students study various ecosystems, including Midwestern prairies, North Carolina saltmarshes, and Caribbean coral reefs. Please call Jeff De Pew, HSA Coordinator, at 577-5135 for more information.

Coming in June

The following class at Shaw Arboretum was omitted from the 1994 Adult "Courses and Lectures" brochure mailed recently to members. Please call the Arboretum at (314) 451-3512 for registration information.

Nighttime Insect Safari

As vast and fascinating as the great herds of Africa are the night flying insects at the Arboretum. Join us as we lure these mysterious creatures from their haunts with blacklights. Marvel with us at their diversity and adaptations! Please wear dark colored clothing and dress for hiking.
Jim Hunt, associate professor
of biology, UMSL;
Gary Schimmelpfenig,
Arboretum education staff
Friday, June 10, 8:30 to 11 p.m.
Arboretum Visitor Center
$10 member, $12 non-member

D'Arcy Celebrates 25 Years

William G. D'Arcy, Ph.D., was honored for 25 years at the Garden at a staff meeting in January, 1994. D'Arcy, who was profiled in the September/October 1992 *Bulletin*, is an expert in the Solanaceae, or potato, family He received his doctorate from Washington University in 1972.

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3.

PLANNING FOR THE NEW RESEARCH BUILDING

A conversation with Ted Christner and Lou Saur, architects.

4.

DEMONSTRATION GARDENS

The 23 outdoor residential gardens at the Kemper Center are scheduled for groundbreaking this year.

6.

YOU AND THE ENVIRONMENT

Sound horticultural practices at the Garden are a matter of common sense.

7.

TRUSTEES' ANNUAL MEETING

Tom K. Smith and Sydney Shoenberg are honored for years of service.

10.

HOME GARDENING

Small fruits make attractive and delectable additions to the landscape.

12.

CALENDAR OF EVENTS

The annual Spring Flower Show, Gardening by Design, and lots more.

14.

NEWS OF THE MEMBERS

The Members' Board elects new officers.

16.

RESEARCH DIVISION NEWS

The Bryology Department is renowned for its studies of mosses.

20.

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spring *flower show*

March 12 -- April 10, 1994
9 a.m. to 5 p.m.
Orthwein Floral Hall
Members' Preview:
Friday, March 11
5 to 8 p.m.

A New England fishing village is the setting for this year's celebration of the arrival of springtime. Sand dunes, wooded beachfront, sailboats and dockside buildings complete this colorful display of coastal plants including dogwoods, azaleas, ornamental grasses, freesias, irises, tulips, grape hyacinths, columbines, astilbes, primulas, nasturtiums, and more.

and remember—

KINGSHIGHWAY IS OPEN!

Missouri Botanical Garden BULLETIN (ISSN 0026-6507)
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B U L L E T I

Missouri Botanical Garden

MAY-JUNE
1994

VOLUME LXXXII
NUMBER THREE

Comment

I WOULD LIKE TO TAKE THIS OPPORTUNITY to inform Garden members of our recent decision to close the Desert House to visitors. As of May 16, 1994, the greenhouse will be closed and will remain closed until funding can be found to build a new facility. The plant collection will be evaluated carefully and valuable and irreplaceable plants will be maintained in Garden greenhouses where possible. Working with the Henry Shaw Cactus Society, appropriate locations will be sought for any other valuable portions of the collection that cannot be handled at the Garden.

This decision is the result of careful assessment of our options in the face of tight resources, which are extremely limited following the loss of Proposition E last November. The Desert House was opened in 1914 and is the last remaining component of a complex that earlier succumbed to old age. The last major renovation to the House was in the late 1960s, when the glass roof was replaced with plastic. Since then routine maintenance has included painting, work on the east facade and the mechanical systems, and replacement of columns on the north entrance.

RICHARD BENKOF

Desert House Will Close May 16

Overall the House is in poor condition. The windows and associated wood framework are rotting and in need of complete replacement. The steel structure is severely rusted and several mounting plates are cracked. The plastic roof is deteriorating, causing severely reduced light levels for the plants, and although the building is not unsafe, it would require major renovation to remain open as a display greenhouse. The plants on exhibit are slowly declining due to the poor light and soil conditions.

At the present time we lack funds to renovate the existing structure or build a new one. Even closing the facility and making minimal renovations, which would allow us to maintain the valuable plants specimens, would involve considerable costs.

It is disappointing to all of us to have to deprive visitors of the opportunity to see desert plants at the Garden. However, we feel that this option is preferable to presenting an inadequate display or using our constricted resources on temporary measures. We ask for your patience and support until we can locate the funding to complete the Climatron complex by building a new Desert House facility. We hope you will take advantage of the first two weeks in May to pay a farewell visit to the House.

Meanwhile, this issue of the Bulletin is filled with exciting news and upcoming events. We look forward to welcoming you to the Garden this spring for Rose Evening, Purple Martin Evening, Members' Musical Evening, and extended summer hours that begin Memorial Day weekend.

— Peter H. Raven, Director

Rose Gardens Win AARS Award

THE LEHMANN AND GLADNEY ROSE GARDENS at the Missouri Botanical Garden have received the All-America Rose Selections 1993 Award for Outstanding Maintenance. The honor is given annually to gardens that surpass AARS's high standards for rose care and presentation. "Public gardens featuring AARS varieties are a valuable asset to the organization," said Larry Burks, president of AARS. "The Missouri Botanical Garden has met our standards of excellence and in turn preserved AARS's reputation for providing high quality roses."

AARS public gardens contain a minimum of 800 rose bushes and offer special displays of outstanding new varieties chosen by AARS for their beauty, novelty, and vigor. Beginning each June, the gardens offer an exclusive preview of the coming year's outstanding new varieties. There are 139 AARS public gardens located throughout the United States. AARS is a non-profit organization dedicated to rose research and promotion. AARS members represent more than 90 percent of the nation's total rose production.

"This is the second straight year and the third year out of the last four that this honor has been awarded to our rose gardens," said Barry Dillon, the Garden's rosarian. "We are very pleased and honored by the recognition."

Moving?
Please remember to send us your new address.

To avoid missing any of your membership mailings, we need notification of your new address at least three weeks before you move. Please enclose the mailing label on the back cover of this *Bulletin* and mail to:

Name:_____

Old Address:

Street_____

City_____

State_____ Zip_____

New Address:

Date effective:_____

Street_____

City_____

State_____ Zip_____

On the Cover

Cho-On-Baku waterfall in the Japanese Garden.

Photo by King Schoenfeld

Editor

Susan Wooleyhan Caine
Missouri Botanical Garden
P. O. Box 299
St. Louis, MO 63166-0299

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The BULLETIN is sent to every member of the Garden as a benefit of membership. For a contribution of as little as $45 per year, members also are entitled to: free admission to the Garden, Shaw Arboretum, and Tower Grove House; invitations to special events and receptions; announcements of all lectures and classes; discounts in the Garden Gate Shop and course fees; and the opportunity for travel, domestic and abroad, with other members. For information, please call (314) 577-5118.

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MISSOURI BOTANICAL

JUN 0 2 1994

GARDEN LIBRARY

E. Desmond Lee & Family
Education Program

A MAGNIFICENT GIFT BY MR. E. DESMOND LEE and his family has established a new science education partnership among the Missouri Botanical Garden, the St. Louis Science Center and the Saint Louis Zoo. The program will support the work of each institution to expand science education opportunities for underserved school children in St. Louis.

The three-way gift was announced at a media reception held at the Living World at the Saint Louis Zoo on Wednesday afternoon, April 13, 1994. A reception for donors and friends was held that evening at the Garden. The media and donor receptions were hosted by the directors of the institutions: Dr. Peter H. Raven, Dr. Dennis M. Wint of the Science Center, and Charles H. Hoessle of the Zoo.

The Science Center and the Zoo joined the Garden in recognizing the Lee family for its commitment to the St. Louis community. The family's goal of promoting educational opportunities for youth recognizes that teachers, provided with appropriate training and support, represent the best conduit for stimulating youth to be enthusiastic and productive learners and contributing members of society.

Desmond Lee said, "Helping your three outstanding scientific organizations to reach out to inner-city children is one of the greatest joys I will ever expect to receive. The essence of my dream is to challenge the children through their teachers to open up a new world of scientific thinking. You are the strongest and most recognized organizations in our community to address this needed program."

Mr. Lee recently retired as chief executive officer of Lee-Rowan Company, a St. Louis firm. He is a longtime member of the Garden and serves on the boards of St. Luke's Hospital, the YMCA, and Columbia College. He supports educational programs at the Herbert Hoover Boys' Club and recently made a significant gift to support the merger of the St. Louis Symphony Society and the St. Louis Conservatory and Schools for the Arts (CASA), which have united as the St. Louis Symphony Community Music School.

Dr. Peter H. Raven said, "We are enormously grateful to Desmond Lee and his family for their support of our education program. Although we did not receive additional tax support last year through Proposition E, which called for expanded teacher training and community outreach, the Lee family has generously stepped in to help make these dreams come true. We applaud their vision and extend our warmest thanks for their faith in our work."

The E. Desmond Lee and Family Education Program at the Missouri Botanical Garden plans to make a serious and significant impact on the teaching of elementary science in inner-city schools in St. Louis. The Garden will work closely with the education community, the science community, and other agencies and organizations to design and implement programs that will result in systemic and long-term changes in the ways that science is taught and in the understanding of science by children. Similar coordinated programs will be established at the Zoo and Science Center.

To achieve its goals, the Garden has designed a two-stage program. Stage One is a five year effort to initiate the outreach program. This start-up time will allow the Garden to develop, test, and implement a program of the highest quality. Stage Two will continue the program well into the future.

Two new full-time staff, a Science Outreach Coordinator and a Lee Family Science Outreach Instructor, will be hired to implement the program. The Science Outreach Coordinator will take the lead in working to reform elementary science education in inner-city St. Louis. The coordinator will plan and implement programs that will achieve systemic reform in schools; coordinate the Garden's work with other science museums, the St. Louis Academy of Science, school districts, and other appropriate community agencies; and raise funds to expand the outreach programs.

The Lee Family Science Outreach Instructor will work closely with the coordinator to present programs and lessons in the classroom. The outreach instructor will help recruit participants, serve as an educational resource to schools, and generally support the entire outreach effort.

CLIFF WILLIS

Above: Family members at the Garden reception on April 13 (from left): Susan Lee, Jo Ann Kindle, Gary Lee, Mary Ann Lee, E. Desmond Lee, Christie Lee Duggan, Andrew and Barbara Taylor.

CLIFF WILLIS

Left to right: Samuel B. Hayes III, chairman of the Board of Commissioners, St. Louis Science Center; Charles H. Hoessle, director, Saint Louis Zoo; Luther J. Rollins, Jr., chairman, Saint Louis Zoological Park Commission; John K. Wallace, Jr., president of the Board of Trustees, Missouri Botanical Garden; Mr. and Mrs. E. Desmond Lee; Peter H. Raven, director, Missouri Botanical Garden; Dennis M. Wint, president, St. Louis Science Center.

The Chinese Garden

ONE of the most exciting features planned for the area adjacent to the new Demonstration Gardens is the Chinese Garden. Construction will begin this summer on the new area, which will highlight the sister city relationship between St. Louis and Nanjing, China. It is being designed by Yong Pan and Associates of Atlanta, Georgia, in association with Environmental Planning and Design of Pittsburgh. Yong Pan is a distinguished architect who received his training in the People's Republic of China.

The new garden will be an exquisite example of the classic Nanjing style. Visitors will enter the garden through a circular moon gate, an emblem of perfection that symbolizes heaven and frames the view of the garden beyond. The central feature of the landscape is a traditional pavilion, a gift to the Garden from the people of Nanjing. The pavilion, constructed with intricate artistry in elegant black, white and gray, has writings of poets inscribed on its columns, with English translations.

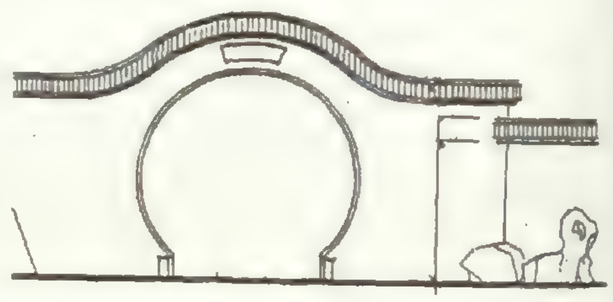
The pavilion and terrace overlook a central pool framed with a carved marble bridge, also a gift to the Garden from Nanjing. A narrow stream cascades over several small waterfalls to feed the pool, where three ornamental stones will be strategically placed to symbolize three mountains of the world and enhance reflections in the water. Rocks from both China and Missouri will be placed throughout the garden, where they are traditionally used as natural statuary, often representing animals or humans. Decorative pavements in many shades of natural stone display patterns of flowers, geometric shapes, or animals. Benches placed throughout the landscape are key focal features, highlighting traditional plantings of rich textural interest. Visitors will exit from the Chinese Garden beneath a grape arbor where, according to folklore, each July 7th they will hear a young couple speak to them from heaven.

The Chinese Garden is an important symbol of the cooperation between the Missouri Botanical Garden, the city of St. Louis, and the People's Republic of China. Earlier this year, G. Shannon Smith, director of horticulture at the Garden, spent two weeks visiting locations in China to study traditional Chinese gardens. Dr. Smith worked with Chinese horticulturists who will assist in obtaining seeds of species traditionally used in their gardens, many of which are difficult to obtain here. Some Chinese wildflowers are being propagated from seed collected by Dr. Smith on his trip. "The origins of some of the plants planned for the Chinese Garden are quite interesting," Dr. Smith explained. "For instance, several years ago Dr. Raven received some seeds from a pine native to northern China, which were distributed to several North American nurseries for propagation. We are acquiring some of these young trees for our Chinese Garden."

The Garden is working closely with colleagues in Nanjing to obtain artifacts for the Chinese Garden. Paul Brockmann, director of general services, recently spent several days in the Nanjing area arranging for construction and shipment of the pavilion and marble bridge, and acquiring benches, stonework, and other features. The Chinese artisans who are creating the pavilion will accompany it to St. Louis later this summer to assist in the installation.

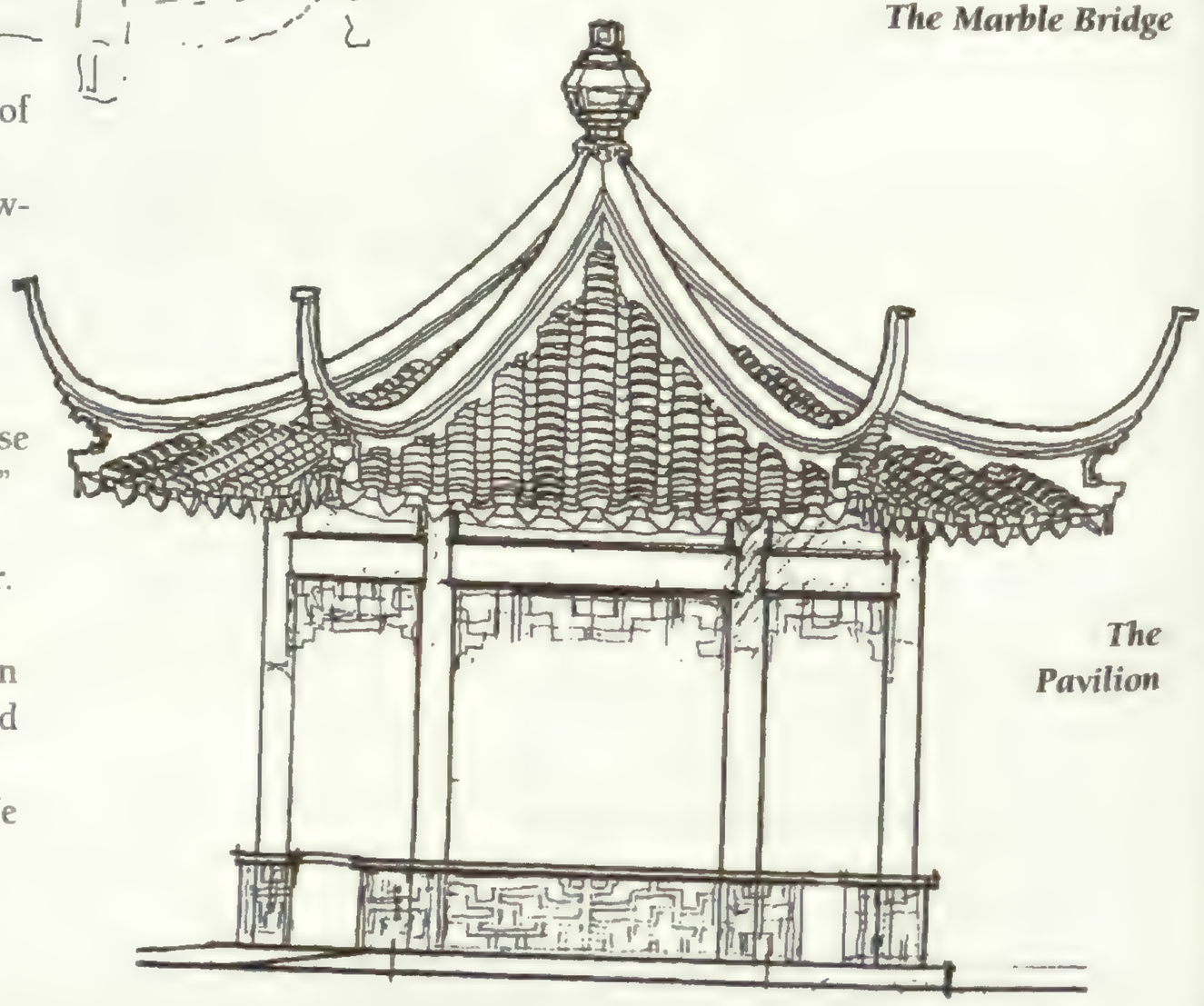
As a further symbol of friendship and in return for the gift of the pavilion and the bridge, the Garden is making a gift of a children's playground to the city of Nanjing. Paul Brockmann met with Chinese officials to help plan the playground, which will include equipment for children of all ages.

"The Chinese Garden will give Americans an exciting and unusual opportunity to glimpse the beauty of Chinese culture," said Dr. Peter H. Raven, director. "This is a very exciting development for us and for St. Louis, and we are eagerly seeking a donor to make the naming gift for this beautiful garden."



The Moon Gate

The Marble Bridge



The Pavilion

New Demonstration Gardens

The Butterfly Meadow

THERE IS PROBABLY NOTHING MORE ENCHANTING in a garden than the sight of butterflies flitting from flower to flower, providing color and movement in the landscape. In support of the Partnership Campaign, Jane Jacobs has chosen to give the Butterfly Meadow, one of the new demonstration gardens at the Kemper Center for Home Gardening. Mrs. Jacobs selected the Butterfly Meadow because of its charm and its display of the interrelationships of plants and animals. It is intended as a fitting tribute to the memory of her grandson, Christopher Biraben. "Christopher loved all living things. He would never allow anything to be harmed. I remember once he had a wasp nest near his bedroom window; he would not let anyone remove it because of his respect and affection for nature," Mrs. Jacobs explained.

Jane Jacobs has been a devoted supporter of the Garden for many years. She has contributed generously throughout the years to the operations of the Garden and to its capital features. The Samuels Bulb Garden was donated by Mrs. Jacobs in memory of her mother and father, Mr. and Mrs. Julian G. Samuels.

The Butterfly Meadow is to be situated at the highest point of the Kemper Center for Home Gardening. It will feature an area encircled by a grass path and a brick edged border planted with shrubs and perennials that attract butterflies. At the center of the meadow, a pool of water is carved out of a limestone boulder. As with all the demonstration gardens, it will show visitors how these effects can be replicated in their own home gardens.

"The Butterfly Meadow will be a delightful feature of the demonstration gardens," said Dr. Peter H. Raven. "We are thrilled by this wonderful gift from Mrs. Jacobs."

RICHARD BENKOF

Shown meeting at the Garden this spring are (from left): Ernestina Short, planned giving officer; Jane Jacobs; Peter Raven

Woodland Garden Improvements

TIM PARKER

TIM PARKER

AS PART OF THE PARTNERSHIP CAMPAIGN, the English Woodland Garden is being expanded to the north of the path. It will feature a pool with an extension of the existing stream that empties into the Japanese Garden to the west and paved paths for better wheelchair access similar to the new paths in the southern section. Above left, workmen dig the new streambed in preparation for lining it with landscaping stones. On the south end of the Woodland Garden a new bog area is being constructed and planted this spring. It will feature species that thrive in wet conditions. Above right, a workman installs a new underground irrigation system in the woodland garden; the excavation for the bog pond is shown in the background.

Engelmann Descendant Visits

TIM PARKER

Dr. George Engelmann was a St. Louis physician and a distinguished botanist who became Henry Shaw's scientific advisor. This past April Mr. Forrester Smith, the great-great-grandson of Dr. Engelmann, visited the Garden. He is shown in the picture above touring the herbarium with Dr. Marshall R. Crosby (right), the Garden's senior botanist. Dr. Crosby is an expert on Engelmann's career and scientific achievements.

In Memoriam

Joseph H. Bascom

MISSOURI BOTANICAL GARDEN ARCHIVES

THE GARDEN staff and friends were saddened by the death of Trustee Emeritus Joseph Holliday Bascom on March 30, 1994. Mr. Bascom, who was 78, retired in 1980 as chief executive officer of Broderick and Bascom Wire Rope Company, a firm founded by his grandfather in 1876. He started with the company in 1940 as a mechanical engineer and served as its president for 13 years.

Mr. Bascom joined the Garden's Board in 1971. He served as second vice president in 1972 and as president of the board from 1973 to 1975. During this period the Garden began to implement its far reaching 1972 Master Plan, which included developing plans for the English Woodland Garden and the Japanese Garden. During his tenure on the Board, Mr. Bascom served as chairman of the Finance and Retirement Committees and worked on the Arboretum Committee. In 1989 he became an Emeritus Trustee and in 1990 he was awarded the Henry Shaw Medal.

In addition to his work with the Garden, Mr. Bascom was a former director of Centerre Trust Company, General Steel Industries, Missouri Pacific Corporation, and the Missouri Historical Society.

In an interview in the *Bulletin* published in 1987, Mr. Bascom said, "We went from a struggling operation where we could hardly afford to sweep the leaves off of the sidewalk to a new leadership which has made the Garden a respected institution worldwide. The support of our members and the public has made it all possible."

Director Peter H. Raven said, "Joseph Bascom made an extraordinary contribution of his time and energy to the Missouri Botanical Garden, for which we will always be grateful. It was a privilege to benefit from his experience for so many years, and we will miss him." ■

Garden Trustees Are Honored

ON FEBRUARY 23, 1994, six Trustees were recognized for their years of outstanding service to the Garden.

Robert Brookings Smith has served on the Board of Trustees for 42 years. He was president of the Board from 1958 to 1962 during the building of the Climatron and was largely responsible for the restoration of Tower Grove House. He and his family have long supported the Garden's research program, and recently their generosity made possible the Brookings Interpretive Center. Mr. Smith has been an Emeritus Trustee since 1981 and is a two-time recipient of the Henry Shaw Medal.

Warren M. Shapleigh joined the Board in 1958. In the past 36 years he has been instrumental in attracting substantial financial support for Garden projects and has chaired or served on the Finance, Executive, Nominating, and Sculpture Committees. The Shapleigh Fountain, one of the most popular features of the Garden, is a gift of his family and friends in memory of his father. Mr. Shapleigh became an Emeritus Trustee in 1985.

Clarence C. Barksdale has been a Trustee since 1964 and an Emeritus Trustee since 1988. Mr. Barksdale has always been a leader in St. Louis civic affairs and has provided invaluable leadership in soliciting the chief executive officers of major corporations and members of Civic Progress for the Garden's 1977, 1987, and current capital campaigns. He serves on the Finance Committee.

TIM PARKER

From left: Warren Shapleigh, Daniel Schlafly, Robert Brookings Smith, Clarence Barksdale, John Wallace, Hal Wuertenbaecher.

Harry E. Wuertenbaecher was recognized for over 30 years of service. He began his involvement at the Garden working with the Members' Board and was elected to the Board of Trustees in 1963. Elected president in 1967, he supervised the capital campaign that supported the construction of the Lehmann Building. He continues to be active on the Henry Shaw Committee and the Buildings and Grounds Committee. In 1990 he received the Henry Shaw Medal.

Daniel L. Schlafly was recognized for more than 20 years of continuous service to the Garden, although he first served on the Board in 1961 as an ex-officio member during his presidency of the St. Louis Board of Education. He was elected to the Garden's Board in 1972 and became an Emeritus Trustee in 1982. He and his wife Adelaide have maintained their strong commitment to minority education by supporting outstanding programs that seek to reach an ever-broader constituency in St. Louis, including the nationally recognized ECO-ACT Program and the Ernest E. Just Scholarship.

In addition to the above awards, the Board of Trustees presented a special recognition proclamation to **Mrs. Walter G. Stern**, who became a Trustee in 1985. Nora Stern's outstanding service as a Garden volunteer began in 1963 when she joined the Members' Board. She provided leadership for the membership program with three terms as president, in 1969-72, 1977-79, and 1983-85; during this period Garden membership increased from 2,000 to 16,486. Nora has also given tirelessly of her time, creativity, hard work, and energy in chairing benefits, gala, and other major events at the Garden, including the 1976 Chrysanthemum Ball with Gloria Vanderbilt, the 1984 125th Anniversary Party, the 1988-89 Fragrance Festivals, the 1989 Centennial Benefit, the 1991 Lord & Taylor Benefit, the 1992-93 "Best of Missouri" Markets, and the annual Henry Shaw Dinner.

The Garden has been fortunate to have the magnificent support and outstanding service of its Trustees. President of the Board John K. Wallace, Jr. extended thanks on behalf of the Garden to all those honored.

TIM PARKER

John Wallace with Nora Stern

RICHARD BENKOF

The Brookings Interpretive Center, funded in part by the Charitable Remainder Trust of Mrs. Mahlon Wallace

The Jenkins Day Lily Garden, endowed by the Ada Kling Charitable Remainder Trust

Free Seminars On Financial Planning

May 10 and May 16, 1994

9 a.m. to noon

Did you ever wonder what probate is, exactly?
How you can eliminate estate taxes?
How to plan for your family's future?

There are dozens of commonly asked questions about financial planning. People would like to know the answers — but are hesitant about having to pay an attorney or an advisor for the information. The Garden is offering a wonderful solution: a free financial planning seminar for members and friends, with two opportunities to attend. Three outstanding professionals will present the program on Tuesday, May 10, and again on Monday, May 16, from 9 a.m. to noon.

Why does the Garden hold financial planning seminars?

Through the years the Garden has relied and continues to rely on gifts from its members and friends. Planning is a tool that benefits all aspects of a person's strategy for the future — the charitable as well as the general. Many times careful structuring of one's plan will direct how and when a gift can be made that will have positive effects for the donor as well as for the Garden. We would like to provide this information as a service to our members and friends.

Panelists

The seminars are presented by noted professionals:

• **Matthew G. Perlow**, an estate planning attorney with Peper, Martin, Jensen, Maichel and Hetlage, has led previous financial seminars at the Garden. His specialty is helping people assess their future needs and find solutions for them.

• **Sonja Nelson**, CFP, also a veteran speaker at the Garden, is a vice president at Commerce Bank, where she is a trust specialist with broad experience in financial planning.

• **John G. Gatewood**, agency supervisor for the Edward T. Hempstead General Agency of Northwestern Mutual Life, is participating in his first Garden seminar. Mr. Gatewood is a leader in developing innovative uses of life insurance as a planning tool.

RICHARD BENKOF

The Portico in the Shoenberg Temperate House, a gift in memory of Jane Pelton, made possible by a bequest

The Garden features shown on this page were made possible through some of the special gifting techniques featured in the seminar.

Reservations

Admission to the seminars is free. Reservations are required to ensure seating and may be made by calling Tina Short at (314) 577-9532. Members are welcome to attend either or both of the sessions.

YOU & THE

ENVIRONMENT

Missouri Botanical Garden
Environmental Policy Statement

Accomplishing the Garden's mission depends on the responsible management and conservation of the world's biodiversity. The quality of human existence depends on an environment that is healthful in all respects. For these reasons, the Garden places major emphasis on educating individuals to take responsibility for the overall quality of the environment. In addition, the Garden promotes public understanding of environmental issues locally, nationally, and internationally.

Particular goals of the Garden's programs are the conservation of biodiversity, sound horticultural practices, international understanding and action, and the responsible use of all resources. The Garden emphasizes these goals in its own activities and encourages individuals and other organizations to do so as well.

Environmental Education Programs

The Missouri Botanical Garden has always been dedicated to educating people about plants. In recent years the Garden has expanded its mission to include providing science and environmental education throughout the St. Louis community. Garden programs seek to change the attitudes and ecological practices of children and adults.

The Education Division at the Garden has several goals in its environmental programs. Staff members work to improve science education in schools; to teach ecology and environmental science to children; to train teachers to understand ecology better and teach more environmental science; to provide instructional materials and resources for teaching about ecology and the environment; and to involve urban children in environmental education. A new initiatives currently under development is the E. Desmond Lee and Family Education Program (see page 3).

Programs for Children

- **Classes** – Instruction in field ecology and the outdoors for elementary and secondary students;
- **Tours** – Guided tours of the Arboretum;
- **Earthkeepers** – An intensive four-day on- site experience plus yearlong classroom work that builds appreciation of the natural world and commitment to studying the environment;
- **Pitzman Nature Study** – Summer classes for preschoolers and their parents introduce children to the natural world;
- **Henry Shaw Academy** – Classes for students ages 7 to 13 who have demonstrated a strong interest in the natural sciences. Courses are interactive experiences designed to supplement school science programs;
- **Stream Ecology Program** – A year-long field study for 13 to 14 year olds includes canoeing, camping, water monitoring, aquatic research, and water safety;
- **Henry Shaw Explorers** – Year-long field study program for students ages 15 to 18 who may be interested in a career in science. Includes field trips to caves, wolf sanctuaries, swamps, marine research stations, and nature preserves;
- **ECO-Inquiry** – Hands-on ecological study for fifth grade students in area schools;
- **Litzsinger Road Summer Ecology Study** – A summer science camp for inner city pre- teens;
- **ECO-ACT** – An environmental leadership program for high school students who learn to teach ecology to elementary school children;
- **Magnet Program** – Environmental instruction for children enrolled in the Mullanphy-Botanical Garden and Stix Investigative Learning Centers;
- **School Partnership Program** – The Garden works with St. Louis Public Schools to offer programs in natural science that bring together students from different cultural backgrounds.

Teacher Training Programs

- **Ecology of Aquatic Environments** – Aquatic ecology and water monitoring for middle school teachers;
- **Ecology for Teachers** – A two-week workshop on environmental science emphasizing hands-on activities and lessons;
- **Natural Science Institute for Elementary Teachers** – A year-long program leading to improvement in classroom biology instruction;
- **Schoolyard Ecology Teacher Institute**– A nation-wide initiative to develop a handbook for teaching environmental science outdoors with activities that can be done on school property;
- **Exploring Ecology through Inquiry** – Curriculum that focuses on student centered investigative learning;
- **Field Methods in Ecological Investigations** – Field ecology research for secondary school science teachers;
- **Litzsinger Road Ecology Center Internships** – Internships for future teachers stress environmental science and development of teaching techniques;
- **National Science Foundation Project for Science Literacy** -- The Garden and four other midwestern botanical institutions are collaborating on a landmark project to change the way school classes use field trip experiences.

The Education Division maintains a number of resources and materials for teachers and students:

- **Stupp Teacher Resource Center** – A reference library of books, teaching aids, and audio-visual materials;
- **Suitcase Science** – Kits of supplies, props, teaching aids and suggested activities on various topics in science;
- **MBG Videos** – Series on plant biology, ecological habitats, and environmental issues for classroom use in grades K-3;
- **Aquatic Ecology and Water Quality** – A curriculum for middle school students, includes a suitcase science kit;
- **Stream Ecology Journal** – A handbook for teachers and students for use in learning aquatic ecology and investigating water quality.

Programs for Adults

The Horticulture Division emphasizes environmental education for adults with the Master Composter Program, classes in gardening techniques and nature study, and all programs and demonstrations at the Kemper Center for Home Gardening. High school and college students serve internships with the Horticulture Division. In all programs, issues such as pesticide use, water conservation, soil conservation, integrated pest management, protecting biodiversity and natural plant populations, and low-impact gardening techniques are presented. ■

Celebrating Native Plants

INTEREST in our native wildflowers is at an all time high, and this spring the Garden is participating in special events that celebrate native plants. Programs will be held at the Garden and at Shaw Arboretum in Gray Summit, rain or shine. Free with regular admission.

Celebrating Wildflowers

may 23 – 29, 1994

Now in its third year, this is a national program sponsored by the United States Forest Service.

may 22 – may 29

Guided Tours

1 to 2 p.m., daily. The Garden Guides lead tours that feature Missouri plants and trees on the Garden grounds.

may 22 sunday

Arboretum Wildflower Walks

Short tours of the Whitmire Wildflower Garden, and longer hikes through the wildflower preserves at Shaw Arboretum. 9 to 10:30 a.m.; 10:30 to noon; 1 to 2:30 p.m. Please call (314) 451-3512 or 451-0850 to register.

may 23 monday

Wildflowers and Their Companions

10 a.m. June Hutson, MBG horticulturist and curator of the Shoenberg Temperate House, will lead a tour of the Rock Garden. Call (314) 577-9434 to register. Meet at the Rock Garden.

may 23 monday

"Prairie Portraits" and other exhibits

10 a.m. to 4 p.m. daily through June 12, Kemper Center for Home Gardening. Displays on rare and endangered plants by the U.S. Forest Service and photographs of the experimental prairie at Shaw Arboretum by MBG staffer William Davit.

may 24 tuesday

Endangered Species in Our National Forests

2 p.m., Kemper Center for Home Gardening. A lecture by Dr. Larry Stritch of the U.S. Forest Service. Limited seating.

may 25 wednesday

Missouri Native Plant Society Meeting

7:30 p.m., Missouri and Botanical Rooms, Ridgway Center. William Davit will present a slide lecture, "Native Plants of the Tall Grass Prairie in Missouri." Limited seating.

may 26 thursday

Gardening with Wildflowers

7:30 p.m., Beaumont Room, Ridgway Center. Arboretum horticulturist Scott Woodbury will present a slide lecture on gardening with native plants. Free seedlings will be given away. Limited seating.

may 27 friday

Endangered Plants at the Garden

10:30 a.m., grounds and greenhouses. MBG horticultural taxonomist Dr. Alan Lievens will lead a tour of rare and endangered plants cultivated at the Garden for the Center for Plant Conservation. Call 577-9434 to register. Meet at Ridgway Center lobby.

may 29 sunday

Arboretum Wildflower Walks

Short tours of the Whitmire Wildflower Garden, and longer hikes through the wildflower preserves at Shaw Arboretum. 9 to 10:30 a.m.; 10:30 to 12 noon; 1 to 2:30 p.m. Call (314) 451-3512 or 451-0850 to register.

Missouri Native Plants Week

june 5 – 11, 1994

In honor of the 15th anniversary of the Missouri Native Plant Society, Governor Mel Carnahan has proclaimed June 5-11, 1994, as Missouri Native Plant Week. Activities at the Garden include:

june 4 saturday

From Inspiration to Publication

10 a.m., Shoenberg Auditorium. Local author and naturalist Karen Haller will discuss her new book, *Walking with Wildflowers in the St. Louis Area.* Book signing follows at the Garden Gate Shop, 11 a.m. to noon.

june 5 –june 11

Guided Tours

1 to 2 p.m., daily. The Garden Guides lead tours that feature Missouri plants and trees on the Garden grounds.

june 5 sunday

Arboretum Wildflower Walks

Short tours of the Whitmire Wildflower Garden, and longer hikes through the wildflower preserves at Shaw Arboretum. 9 to 10:30 a.m.; 10:30 to 12 noon; 1 to 2:30 p.m. Call (314) 451-3512 or 451-0850 to register.

june 5 sunday

Plant Mounting and Illustration Demonstration

10 a.m. to 3 p.m., Ridgway Center. Demonstrations and displays feature research on native Missouri plants.

june 7 tuesday

Nature's Garden: Native Plants and their Habitats in Missouri

7 p.m., Shoenberg Auditorium. Dr. George Yatskievych of the Missouri Department of Conservation and Curator of Missouri Plants at the Garden will present a slide lecture.

june 8 wednesday

An Afternoon with Native Woodies

3 p.m., grounds. Join Garden horticulturist Chip Tynan for a tour of native woody plants at the Garden. Call 577-9434 to register. Meet in Ridgway Center lobby.

june 10 friday

Landscaping with Natives

2 p.m., Missouri and Botanical Rooms, Ridgway Center. Master Gardener Ann Case will present a slide lecture followed by a short walk through the Garden grounds. Please call 577-9434 to register.

june 11 saturday

Forum on Restoration of Plant Communities in Missouri

1:30 p.m., Shoenberg Auditorium. Representatives from the U.S. Forest Service, Missouri Department of Natural Resources, Shaw Arboretum, The Nature Conservancy, and the Missouri Department of Conservation discuss restoration strategies and philosophy.

Home Gardening

LANDSCAPING WITH NATIVE PLANTS

EFFORTS TO PROMOTE native plants have been going on for a long time in the Midwest, though never before with such vigor. New publications on natives fill bookstore shelves and cover a range of topics from habitats and butterfly gardening to tallgrass prairies and plant conservation. Nurseries nationwide are offering annually increasing lists of showy natives and promote a new ethic in landscaping called eco-gardening, short for ecology gardening, a landscape method based on emulating natural plant communities rather than merely arranging plants by line, form, color, and popularity. In essence, native plants have become the workhorse of a new generation of landscapes in America and are used for their intrinsic hardiness, disease resistance, attraction for wildlife, and to promote regional beauty and plant conservation.

Why Landscape with Natives?

Perhaps the earliest supporter of native plants was Wilhelm Miller, who was appointed head of the University of Illinois extension program in 1912. Professor Miller published numerous papers on the application of native plants to residential design, farmsteads, parks, highway roadsides, and prairie restoration. His revolutionary ideas paved the way for further native plant use.

Today, native plants are used in all the ways promoted by Miller, ranging from simply including showy native plants in home and public gardens to the complexities of restoring plant communities like prairies, with their diversity of plants, insects, and small mammals. Other native plant enthusiasts are environmental educators, who use natives in student-based prairie planting projects; highway engineers and farmers, who plant native grasses for low maintenance erosion control and pasture; and landscape architects, who often promote regional natives to create a sense of place.

Ossian Simonds, who is thought of as the earliest practitioner of what Miller called "the prairie spirit in landscape design," provided valuable insight on the reasons why native plants are used. In a lecture presented in 1922 at the University of Illinois, Simonds said: "Nature teaches what to plant. By going to the neighboring woods and seeing the trees and plants and shrubs they contain, one can tell pretty accurately what trees will do well in any given locality." In other words, native plants make excellent landscape plantings because they have adapted to local weather and soil conditions and are more resistant to native diseases.

Midwest residents have deeply set images of regional beauty which create a comfortable sense of belonging. They are familiar with Ozark hillsides covered with flowering dogwood in spring, gnarly old dry ridge oaks, and perhaps graceful tallgrass prairie swaying in the autumn wind. Humankind has always been dependent on a spiritual connection with nature, which makes our surroundings seem unique and inspiring. We have come to take this bond for granted; it is sometimes referred to as sense of place, more often referred to as "home".

Perhaps the most compelling reason for using native plants is to increase public awareness of the importance of saving native organisms and their habitats. The loss of plant communities and the near extinction of about three thousand North American species from agriculture, logging, and urban development, is of critical importance. By using natives, gardeners become actively involved with the restoration process and become more aware of the urgent necessity of preserving the few remaining natural areas left undisturbed.

The Search for Natives

Native plants and seeds are readily available from botanical gardens, native plant societies, and nurseries nation-wide. Usually the former two sources are safe bets if you want bonafide "nursery propagated" plants. This means that plants are grown from seed, division, or cuttings, and are not taken from wild populations. There are many reputable nurseries that offer nursery propagated native plants, and will proudly say so. Don't forget to ask.

On the other hand, many nurseries continue to thrive on selling wild harvested native plants, a practice that often leads to irreparable damage to wild populations. Wholesalers of this sort are usually located near their sources in large wilderness areas like the southern Appalachians, the northern Adirondacks, and the Ozarks. Collection on public and private lands nationwide is responsible for the removal of up to several hundred thousand plants a year. The plants eventually appear in wholesale catalogs for bargain prices, or are sold to retail mail-order nurseries and garden centers. Retailers often containerize the plants and sell them misleadingly as "nursery grown". It is wise to quiz your local nursery people about the origins and propagation methods of the native plants they sell.

Fortunately, wild harvesters are beginning to suffer from increased competition. Popular demand for natives has driven plant research forward, resulting in more efficient propagation methods and new cultivars. For example, successful European nurseries have flooded the world market for Echinacea, a popular medicinal herb, causing prices to fall, undercutting wild harvesters. Similarly, many vigorous new and easy to propagate cultivars are becoming more readily available and are practical alternatives to wild collection. You can be certain that cultivars are nursery propagated because they can only be grown from cuttings and division.

A satisfying and easy way to acquire natives is to collect seeds and grow your own. Good sources are roadbanks, power line clearings, railroad corridors, or nearby gardens. Avoid collecting in natural areas or botanical gardens without permits or permission, as strong fines or reprimands may result. Learn to identify and propagate plants by studying wildflower and propagation guides first. Collecting seed of common wildflowers is acceptable but is detrimental to natural popula-

tions of rare and endangered species. Never take more seed than you can grow; always be frugal in your collecting.

Growing Natives

Like most cultivated perennials, native plants have specific moisture, soil, sunlight,and nutrient requirements. Gardeners often attempt to change conditions to accommodate plants, rather than select the plants appropriate for the conditions. In order to grow plants successfully and with the least effort, you should know where they grow naturally. I have encountered far too many gardeners who try to grow dry-loving plants on a quagmire, or prairie plants in the woods. Even if the plants survive, they rarely thrive. And remember, plants with similar growth conditions exist together in nature, and should be planted together in native landscapes.

Growing a diversity of natives in garden, along highways, or in restoration areas reduces the isolation of native plant populations, which often exist only in scattered spots in nature preserves. Planting new communities also establishes green corridors vital for bird and insect survival. Since most native insects don't pose a threat to native plants, insecticides should be avoided. They harm native plants by killing beneficial insects like lady bugs, dragon flies, and praying mantis which prey on many plant-eating critters. Insecticides can also reduce local butterfly populations significantly.

For More Information

Missouri Wildflowers by the late Edgar Denison and *Missouri Wildflowers of the St. Louis Area* by Erna Eisendrath are good sources for native plant information. In addition, demonstrations of native plant communities can be seen in the Whitmire Wildflower Garden at Shaw Arboretum in Gray Summit. And watch for the displays of native plants in the new demonstration gardens planned for the Kemper Center for Home Gardening.

Anyone who enjoys the beauty of nature is encouraged to create an eco-garden and share it with others. The process helps to increase public awareness of the natural world, while creating a vital habitat for native organisms. Although we live in a society where destruction is considerable, we also possess the ability to create a more stable and colorful world through using native plants.

--Scott Woodbury, staff horticulturist, Shaw Arboretum

CLIFF WILLIS

The new Whitmire Wildflower Garden is a spectacular showcase for native plants in the landscape. Visit the Whitmire Garden at Shaw Arboretum in Gray Summit this spring for a look at the beauty of native species in a variety of natural habitats.

TELEPHONE HELP

The Garden has several telephone services available to assist you.

GardenLine **577-9400**
24-hour recorded information about Garden events, hours, admission and directions.Outside area code 314, call **1-800-642-8842** toll free, 24 hours a day.

Horticultural Answer Service (314)577-5143
Monday through Friday, 9:00 a.m. to noon, Master Gardeners are on hand to answer your gardening questions.

HortLine **(314) 776-5522**
24-hour recorded gardening information is available with a touch tone telephone. You will need a brochure listing the hundreds of HortLine topics in order to use the service; you may request a brochure by calling the Kemper Center for Home Gardening at (314) 577-9440, 10 a.m. to 4 p.m. daily. **Plants in Bloom at the Garden** is updated weekly. Press 3 when you call HortLine.

Master Composter Hotline (314) 577-9555
9:00 a.m. to noon, Monday through Friday. Specially trained Master Gardeners are on hand to answer your questions about yard waste management techniques. After hours leave a message and your call will be returned. The Master Composter program is supported by the Monsanto Fund.

The Kemper Center for Home Gardening is open 10 a.m. to 4 p.m. daily.

The Plant Doctor is available at the Kemper Center for walk-in consultations from 10 a.m. to noon and 1 to 3 p.m. Monday through Saturday.

Admission to the Kemper Center is free with regular Garden admission. For information on classes and activities at the Center, please refer to the Adult Education brochure mailed to all members, or call 577-9440.

Calendar

may 6 friday

A Garden Party with Mom

Noon, under the outdoor tent, Ridgway Center. (Seating begins at 11:50 a.m.) Bring your mother and special friends to a lovely luncheon featuring a showing of spring fashions by Famous-Barr. $40 per person, members; $50 per person for non-members. Call 577-9500 by May 3 for reservations.

may 7 & 8

saturday & sunday

African Violet Show

9 a.m. to 5 p.m. both days, Orthwein Floral Hall. The Metropolitan St. Louis African Violet Council holds its 40th annual juried show and plant sale. All sizes, colors, and combinations of these popular plants will be shown. Free with Garden admission.

may 27 friday

Rose Evening

5:30 to 8:30 p.m., grounds. This popular members' event features the beautiful Gladney and Lehmann Rose Gardens. Garden horticulture staff will be on hand to answer questions on rose care. The evening includes music, cash bar, and an optional buffet supper, available by reservation only. Watch your mail for a special invitation. For members only.

Members' Days

may 19 thursday *Purple Martin Evening*

6:30 p.m., Shoenberg Auditorium and grounds. Our 13th annual celebration of these popular birds features a lecture and film with W. Ashley Gray III, curator of purple martins, followed by a stroll through the Garden's purple martin neighborhood. Cash bar. No reservations are required, but seating for the film is limited. Free, for members only.

june 17 friday *Members' Musical Evening*

5:30 to 9 p.m., Spoehrer Plaza; concert begins at 7:30 p.m. The popular Gateway City Big Band presents the sounds of Glenn Miller for an evening under the stars. Bring a picnic supper if desired, and lawn chairs or blankets for seating. Cash bar. Limited concert seating is provided. Free, for members only.

may 11 wednesday

Conversations with Anne Keefe

7:30 p.m., KETC Channel 9. Program features the Garden's director, Dr. Peter H. Raven, focusing on the role of the director in administering the scientific and educational mission of the Garden.

may 14 saturday

O'Fallon Iris Society Show

Noon to 5 p.m., Orthwein Floral Hall. Hundreds of entries in a juried show and sale. Free with Garden admission.

may 15 sunday

Greater St. Louis Iris Society Show

Noon to 5 p.m., Orthwein Floral Hall. A rainbow of blooms and arrangements in a juried show and sale. Free with Garden admission.

may 21 & 22

saturday & sunday

Horticulture Society Show

Noon to 5 p.m. Saturday, 9 a.m. to 5 p.m. Sunday, Orthwein Floral Hall. Vegetables and cut flowers are judged and displayed by the Greater St. Louis Horticulture Society. Free with Garden admission.

may 22 sunday

Dahlia Society Sale

9 a.m. to 5 p.m., Orthwein Floral Hall. The Greater St. Louis Dahlia Society holds its annual plant sale. Buy four plants and get the fifth one free! Information on dahlia care will be available. Free with Garden admission.

may 25 wednesday

"I Love Eating" Class

11 a.m. to 12:15 p.m., Kemper Center for Home Gardening. Today's topic: "So What's a Carbohydrate, Anyway?" On the last Wednesday of every month through October, join local chefs, food writers, and dieticians to learn how to cook and eat for great health. Door prizes, including home-delivered catered dinners and cookbooks, will be awarded at each class. Sponsored by the Garden in conjunction with the American Heart Association and the Missouri Soybean Merchandising Council. Classes and admission are free, but reservations are required: please call 45-HEART or 1-800-255-9919 to register.

may 28 & 29

saturday & sunday

Rose Society Show

Noon to 5 p.m. Saturday, 9 a.m. to 5 p.m. Sunday, Orthwein Floral Hall. The Rose Society of Greater St. Louis holds a juried show with hundreds of beautiful blooms . Free with Garden admission.

may 30 monday

Summer Hours Begin

9 a.m. to 8 p.m. daily through Labor Day. Come to the Garden on summer evenings for a quiet twilight stroll.

Dahlia Society Sale

9 a.m. to 5 p.m. See May 22.

june 1 wednesday

Jazz in June

7:30 p.m., Cohen Amphitheater. Summer nights, simmering jazz! Tonight featuring the Rob Block Latin Jazz Sextet. Bring your picnic supper, a blanket or lawn chairs, and enjoy some of St. Louis' most exciting jazz ensembles performing under the stars. Please note: alcohol and glass containers may not be brought into the Garden grounds. A cash bar will be available. In case of rain, cancellation of the evening's concert will be announced by 3 p.m. Concerts will not be rescheduled or moved indoors. Concert admission is $3 for members, $5 for non-members.

june 6 monday

Plant Clinic

10 a.m. to noon, Kemper Center for Home Gardening. On the spot identification of plants and diagnosis of pests and problems. Free with Garden admission.

june 8 wednesday

Jazz in June

7:30 p.m. The Russell Gunn / John Norment Quintet play be-bop and blues. See June 1 for details.

june 11 saturday

Greater St. Louis Iris Society Show

Noon to 5 p.m., Orthwein Floral Hall. A rainbow of blooms and arrangements in a juried show and sale. Free with Garden admission.

june 15 wednesday

Jazz in June

7:30 p.m. Sounds of New Orleans with the St. Louis Stompers Dixieland Band. See June 1 for details.

june 17 friday

Gateway to Gardening Gala Benefit

7 p.m., cocktails, dinner and dancing. Celebrate the 10th anniversary of the Gateway to Gardening Association with a party to benefit its urban gardening programs. Please call the GTGA office, 577-9484, for more information.

june 18 & 19

saturday & sunday

Lily Society Show

Noon to 8 p.m. Saturday, 9 a.m. to 8 p.m. Sunday, Orthwein Floral Hall. The Mid-America Regional Lily Society presents a juried show and display. Free with Garden admission.

june 20 monday

Plant Clinic

10 a.m. to noon, Kemper Center for Home Gardening. See June 6.

june 22 wednesday

Jazz in June

7:30 p.m. Alto saxophonist Chad Evans and his ensemble. See June 1.

june 29 wednesday

"I Love Eating" Class

11 a.m., Kemper Center for Home Gardening. "Protein–How Much Is Too Much?" See May 25 for details.

Jazz in June

7:30 p.m. The *a cappella* jazz vocals of Pieces of 8. See June 1.

every day

Free Walking Tours

1 p.m. daily. Meet the Garden Guides at the Ridgway Center ticket counter, rain or shine, for a fascinating tour of the Garden. Free with regular admission.

wednesdays & saturdays

Garden Walkers' Breakfast

7 a.m., grounds. In cooperation with the American Heart Association, the grounds open early every Wednesday and Saturday morning to encourage fitness walking. Greenhouses open at 9 a.m. Breakfast is available for purchase in the Gardenview Restaurant, 7 to 10:30 a.m. Admission is free on Wednesdays and Saturdays until noon.

continuing

Ecology of U.S. Agriculture: Past, Present, and Future

9 a.m. to 5 p.m. daily, Brookings Interpretive Center. A pictorial history of American agriculture demonstrates the role of agriculture in the environment, using visual displays, computers, and hands-on activities. Developed jointly by the University of Missouri College of Agriculture, Food and Natural Resources, University Extension, and the Garden. Free with Garden admission.

Members

The Gardener's Marketplace

An Exciting New Benefit for Members

THE LATEST BENEFIT of Garden membership is a new coupon book full of wonderful discounts at the Garden and at many leading gardening-related businesses in the St. Louis area. Every member will receive a coupon book in the mail, together with their new membership cards, when they renew their membership. We extend a special thank-you to the following merchants whose businesses are featured in the coupon book:

Timber Creek Nursery
A. Walbart and Sons Nursery
Kara Meadows Nursery
Shield Shade Tree, Inc.
Hummert Seed Company
Beckman Bros., Inc., Garden Center & Nursery
H. C. Krupp Company, Inc.
Sherwood's Forest
Cottage Garden Outdoor
Sugar Creek Gardens
Gilbert Perennial Farms
Worm's Way Garden Supply & Home Brew Center

Shoenberg Fountain – A Restful Respite

JACK JENNINGS

Visitors and staff find the Shoenberg Fountain at the south end of the Garden a peaceful, quiet place to relax on warm spring and summer days. A level triangular space framed with cool white limestone benches is shaded by overhanging trees. The benches face a tilted triangular fountain with a sparkling film of water that flows over golden travertine stone to disappear beneath the sidewalk. This elegant Garden feature was installed in 1975 and was a gift of the Shoenberg Family.

Mark Your Calendar Today!

"Best of Missouri" Market –
Sunday, October 9, 1994

Gala to Benefit the Garden –
Saturday, November 12, 1994
Watch for exciting details.

Attendance Prizes Donated

For their generous donation of attendance prizes for February, March and April Members' Day events, we extend our very special thanks to:

Sunset Plantland Nursery and Garden Center
Creve Coeur Botanicals
Wild Birds Unlimited of Kirkwood

Instructors and Guides Needed

EACH YEAR over 25,000 children attend tours and classes at the Garden while on field trips with their schools. Ninety highly committed Garden Guides and Volunteer Instructors currently deliver these programs to elementary and middle school classes.

Because funds for staffing are limited, the Education Division is forced to turn away as many requests as it accommodates. With more volunteers, we could serve a much larger school population and more community groups.

In fall, 1994, the Garden will train its next class of Education volunteers, including both guides and instructors. We hope to train at least 30 new volunteers.

If you have one free school day per week, a love of children, an interest in plants and ecology, and the energy to lead programs for three hours a day, this may be the job for you or we may have another place for your special talents. Call 577-5187 for more information.

Master Gardeners Needed

Volunteers are also being recruited to join the St. Louis Master Gardener program. Volunteers are needed to assist with gardening information services, school and community gardening programs, and classes for older adults. Applicants who are accepted for the Master Gardener program will be required to complete the training course to be held Monday afternoons from mid-October, 1994 through February, 1995. For an application with more information about selection, training, and volunteer opportunities, call 577-9441. The application deadline is June 30, 1994.

GARDEN GATE SHOP

THE GARDEN GATE SHOP is pleased to introduce *"The Garden,"* a new set of boxed notecards featuring six wonderful color photographs by Jack Jennings. Jennings is well known for his beautiful photographs, which appear in the Missouri Botanical Garden Calendar each year. The Garden set includes 18 notecards and envelopes for $12.95. The perfect gift for Mother's Day!

New Products

In celebration of spring, the Garden Gate Shop is blooming with many colorful plants and gifts. Come see all the wonderful new silk flowers, cachepots, linens, and delightful garden accessories.

A new cosmetics line is available in St. Louis exclusively in the Gate Shop. Neal's Yard Remedies include soaps, hair care, cleansers, moisturizers, bath products, massage oils, and essential oils. These are simple, effective products, scented with pure essential oils and infusions made from herbs and herbal extracts, organically grown whenever possible.

Gifts & Books

Remember, Mother's Day this year is May 8th and Father's day is June 19th. The Shop is filled with wonderful tools for the gardener, chimes, fountains, bird houses, and the finest selection of gardening and nature books in town. Two new books by local writers are Barbara Perry Lawton's *A Seasonal Guide to the Natural Year: A Month by Month Guide to Natural Events – Illinois, Missouri and Arkansas;* and Karen Haller's *Walking with Wildflowers: A Field Guide to the St. Louis Area.* Both books would be a welcome addition to any outdoor enthusiast's library.

"The Garden"—A new set of boxed notecards available in the Shop

PROFILE

William A. Davit

IN HIS 25-YEAR CAREER with the Garden, Bill Davit has worked at the Garden, at Shaw Arboretum, and currently is the site manager at the Litzsinger Road Ecology Center. For ten of his twenty years at the Arboretum he worked to develop the 78-acre Experimental Prairie, enabling thousands of visitors to enjoy the beauty and biological diversity of this ecosystem. He has developed trails, written trail guides and natural history articles, managed greenhouses, taught classes, and helped hundreds of adults and children gain a deeper appreciation for the natural world.

Davit came to the Garden in 1969 as a research technician to join former director David Gates's biophysical ecology research group. The following year he moved with his family to Shaw Arboretum, where he lived and worked in maintenance, horticulture, and education. Over the years at the Arboretum, Davit taught natural awareness programs for children and adult courses in organic gardening and native trees. He also conducted tours of the Experimental Prairie and wildflower reserve. Lydia Toth, instructional coordinator at the Arboretum, said, "Bill's willingness to teach classes was wonderful. Many people repeated his classes year after year because they enjoyed them so much and always learned something new."

In 1979, Davit began work on the Experimental Prairie project. Reintroducing native Missouri prairie species to 78 acres of land dominated by exotic species was all the more challenging because prairie seed is not readily available from the horticulture trade. With the help of volunteers, Bill collected seed of many native wildflowers from remnant prairie plants throughout the state, propagated the seeds in the greenhouse, and transplanted the young plants into wildflower plots in the prairie. These plots increased diversity and provided on-site nurseries from which to collect more seed. Prescribed burning, haying, and many hours of hand weeding reduced the numbers of invasive exotic plants and encouraged the establishment of the native species. By 1990 the Experimental Prairie contained over 200 species of native plants.

At present, Bill is working to reestablish native species at the Litzsinger Road Ecology Center. He enjoys learning from other restorationists and generously passes on what he has learned to garden clubs and individuals. He serves as a board member of the Missouri Prairie Foundation and has received awards for his prairie photography from the North American Prairie Conference.

When watching Davit working in the prairie and teaching people about native plants, it is difficult to imagine him doing anything else. However, he began his professional life as a geophysical engineer and worked for seven years in the U. S. Navy Hydrographic Office in Washington, D.C., measuring the earth's magnetic field. In the course of this work he traveled to every continent and even survived a plane crash in Antarctica.

Although Davit feels fortunate to have seen so much of the world working for the Navy, he says that his work with the Garden "puts me in touch with things that are really more important, like the functioning of natural ecosystems and how important it is to preserve and protect what's remaining of the natural world."

This article was written by Bill's daughter Carol Davit, a Garden staff member.

Carbon Dioxide Emissions Are Linked to Potential Loss of Biodiversity

A STUDY CO-AUTHORED BY GARDEN BOTANISTS Oliver Phillips and the late Alwyn Gentry has found a link between consumption of fossil fuels and potential biodiversity loss in the tropics, according to a paper published in the February 18 issue of *Science*.

"This is breakthrough research that clearly redefines the relationship and influence of modern society on even the most remote rain forests," said Dr. Peter H. Raven, the Garden's director. "No longer can it be said that such regions — regardless of their locale — are untouched by human hands."

Phillips and Gentry studied data from tropical forest plots around the world and determined that turnover—the rate at which trees are dying and growing—is accelerating. The most plausible reason for this, they concluded, is increased levels of carbon dioxide (CO_2) in the atmosphere, caused primarily by the burning of fossil fuels like coal, petroleum, and natural gas. The probable result of this acceleration is species loss, as longer lived trees are replaced by faster growing secondary species.

This situation should favor light-demanding trees and vines that can take advantage of the changing environment, but could force out more shade-tolerant trees. If the shade-tolerant species decline, then so too will other tropical organisms with life cycles tied to those trees.

"This is a unique study that links for the first time the changes in the planet's chemistry and the changes in the tropical forests," says Stuart Pimm, professor at the University of Tennessee and a member of *Science* magazine's Board of Reviewing Editors. "Turnover is a measure of the environment's temperature and we're running a fever,"he said. "With this study we've located the virus that's infected the patient."

The study measured turnover in 40 study plots in tropical areas of Latin America, Africa and Asia. The forest plots were set up by a variety of scientists over the last 40 years and include nine plots inventoried by MBG scientists and colleagues in the Amazon. By analyzing the data, Phillips and Gentry found significant increases since the 1950s in both the old and new worlds.

Although faster turnover may create a more heterogeneous forest environment, and hence enhance species richness at local scales, large-scale biodiversity levels could decline, Phillips and Gentry wrote.

Alwyn Gentry was senior curator at the Missouri Botanical Garden when he died in a plane crash in Ecuador on August 3, 1993. The world's most knowledgeable scientist on the plants of Latin America, Gentry's contribution to this paper is both a fitting legacy and a sad reminder of the impact of his loss on science. Phillips, a postdoctoral researcher at the Garden, was one of Gentry's students.

Phillips said, "Even if we set aside parks, we can't shield them from atmospheric changes. CO_2 levels right now are higher than they've been in at least the last 160,000 years so plants have no recent evolutionary experience with this. The data shows that we can't easily separate the issues of pollution and extinction."

Ukrainian Botanist Studies American Plants

SERGEI L. MOSYAKIN, head of the Department of Systematics and Floristics of Vascular Plants at the N.G. Kholodny Institute of Botany of the Ukrainian Academy of Science in Kiev, has spent six months at the Missouri Botanical Garden working on the Flora of North America project. It may be surprising that a botanist from Eurasia would be studying plants of North America, but many species of the two regions are the same or closely related.

CLIFF WILLIS

Sergei Mosyakin during his visit at the Garden

The climate of Ukraine, the central agricultural area of the former Soviet Union, is very similar to parts of North America. There are many similar native plants, and species have been introduced as well through "floristic pollution," the introducton of alien species through exchanges of agricultural and horticultural materials. This invasion is an important problem in Ukraine and in the U.S., causing serious danger to ecological stability and biodiversity.

Some species migrated between Asia and North America over the Bering Land Bridge when the continents were joined. Mosyakin explained, "I am especially interested in reconstructing both the historic and modern distribution patterns of native and alien species. In the past three to four years we have discovered over 50 new alien species in Ukraine, and 27 of these are of North American origin."

Mosyakin, an expert on the Chenopodiaceae family, is working to clarify the taxonomy of some of the native and introduced species in North America and Eurasia. "It is urgent that we do this, as some of the alien species are invasive weeds and noxious plants that threaten crops and natural plant populations," he said. "Land development is one of the principal causes of floristic pollution; disruption of natural plant communities destroys the balance that keeps invasive species out."

Sergei is writing treatments of *Rumex*, a genus of the Polygonaceae family, and of *Corispermum, Salsola, Kochia, Bassia, and Cycloloma* of the Chenopodiaceae for the Flora of North America. "These plants are beautiful to me," he said with a smile, "But most people would call them weeds. They include docks, sorrels, lambsquarters, and tumbleweeds. The Chenopodiaceae is complex and poorly known, but my opportunity to work in the United States has, I hope, been helpful in clarifying some of the relationships among these plants."

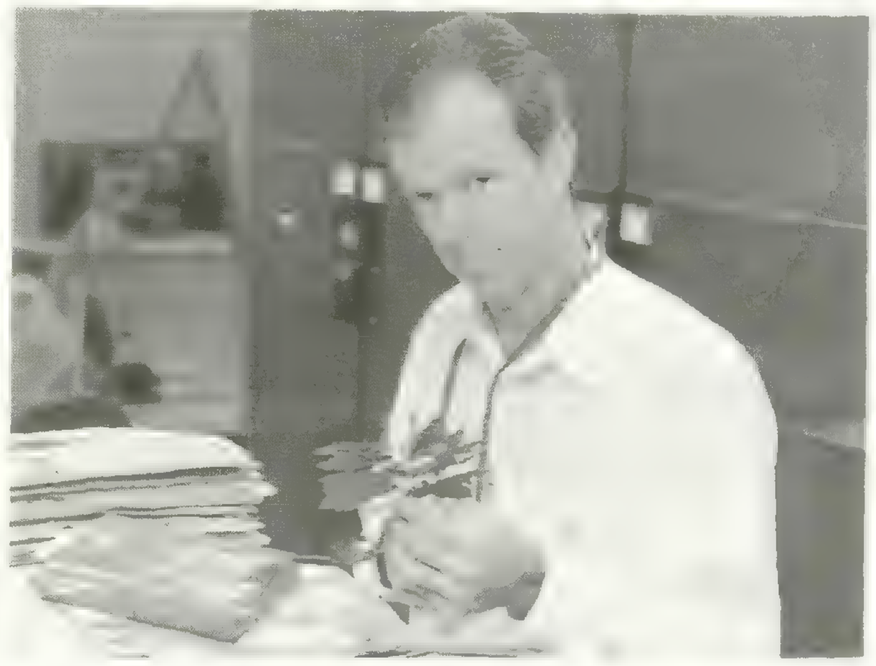
The herbarium in Kiev is one of the largest in the former Soviet Union, second only to the Komarov Botanical Institute in St. Petersburg. "We have about two million specimens and many unique collections," he said, "including fascinating historic collections exchanged with American and European botanists in the 19th century. We have a very old tradition that includes works of Besser, Turczaninov, Schmalhausen, Fomin, Klokov, Kotov, and other noted botanists."

Research in Bolivia

A CORNERSTONE OF THE GARDEN'S BOTANICAL RESEARCH is the strengthening of botanical institutions in those countries where biological diversity is concentrated, so that they have the ability to manage their own resources in a sustainable way. Through training of botanists, assistance with capital improvements, and the sharing of information, the Garden is making a positive impact on wise resource management in the developing world.

The Garden has a strong collaborative botanical research program in Bolivia, a South American country with a wide assortment of habitats, all of which are characterized by high biological diversity. The Garden has enjoyed a long history of mutual collaboration with the botanical community and government of Bolivia.

Timothy J. Killeen at work in the herbarium



TIM PARKER

The program was initiated in 1981; since then the Garden has worked with Bolivian institutions dedicated to botanical inventory, plant ecology, conservation, and the sustainable use of biological resources. Early years were focused on plant collecting and assisting in the establishment of the national herbarium in La Paz. This herbarium, Bolivia's largest, currently has approximately 70,000 accessioned specimens. Training has always been a priority, and in recent years has become a more focused effort, as more Bolivians have entered the field of botany.

Besides working toward the strengthening of local institutions, the Garden is conducting research projects in Bolivia that could have serious impact on environmental policy in the country. Timothy J. Killeen, the Garden's resident botanist in Bolivia, together with Teresa de Centurión, director of the Herbario del Oriente Boliviano, and several young Bolivian botanists, is conducting a botanical inventory of the Noel Kempff Mercado National Park, a 900,000 hectare area situated in northeastern Santa Cruz. The Park incorporates a wide variety of different ecosystems, including humid Amazonian forest, dry forest, semideciduous forest, cerrado savanna, and pantanal wetland. This study is the first step toward the preparation of a management plan for the Park. The Garden will participate in developing the plan, which will deal with ecotourism and community development, among other issues.

In the Estación Biológica del Beni, the oldest biological reserve in Bolivia, the Garden is collaborating with the National Herbarium and the Universidad Técnica del Beni to document the composition of the vegetation in ungrazed, lightly grazed, and heavily grazed grassland. The study will examine the effects of cattle grazing on the species diversity of the grassland. Approximately 70 percent of the Beni is natural grassland, and this habitat forms the foundation of one of the largest cattle-producing regions on the continent. The research will produce information necessary to develop a long term plan for range management in this 200,000-square-kilometer area.

In 1989 the Garden and its collaborators initiated an inventory of the trees of the Eastern Andean montane forest area known as Serraniz Pilón Lajas. The results revealed some of the highest levels of biological diversity yet recorded for Bolivia. Although Pilón Lajas was first recommended for designation as a biological reserve in 1978, no action was taken by the Bolivian government. In the interim, a new road was built through the area and people began to migrate there. In 1992 a variety of organizations began discussing the possibility of obtaining a protected status for the adjacent mountain range and several undisturbed valleys to the west. Responding to a petition from indigenous groups, the President of Bolivia declared it an Indigenous Reserve while simultaneously recognizing it as a Biological Reserve. The Garden's research in the area was critical in defining the natural boundaries for the reserve.

In 1993 the *Guide to the Trees of Bolivia* was published by the Garden and National Herbarium of Bolivia. This multi-institutional effort, begun and guided by Garden scientists, collated the information on Bolivia's trees and produced this valuable reference manual for natural resource managers (see story below).

The Garden has proposed to the Bolivian government a meeting of biologists and policy planners to facilitate the flow of information from biologists to decision makers. This meeting would provide a forum where biologists would have an opportunity to provide reliable information on areas of biological diversity, endemism, and threatened and endangered species. The meeting would be organized by the Missouri Botanical Garden and the National Environmental Defense League (LIDEMA).

Bolivia has one of the most diverse assortment of habitats in all of South America. It is a prime candidate for conservation, since its population density is low but growing rapidly. Its ecosystems are still relatively intact, but its deforestation rate is high. The Garden's work in learning about the natural resources of Bolivia, coupled with its dedication to training future botanists, will be instrumental in helping this nation to preserve and sustain its vast biodiversity.

Guide to the Trees of Bolivia

The Guide to the Trees of Bolivia, published in 1993, was a landmark effort involving much of the botanical community of Bolivia. Edited by Timothy J. Killeen, Emilia Garcia E. and Stephan G. Beck, it involved 35 authors, many of them students. "This turned out to be a great learning experience for many of the authors," Killeen said.

Rather than initiate a great deal of plant exploration for the guide, Killeen explained, "we made a conscious decision to assimilate the existing knowledge about the trees of Bolivia, the result of the last ten years of field collecting."

The book contains descriptions of 120 different plant families, 685 genera and a list of 2733 species. It provides keys, which help botanists identify a given plant, for both families and genera. Alwyn H. Gentry, the late Garden botanist, contributed greatly to the guide through one of his last books, *A Field Guide to the Families and Genera of Woody Plants of Northwest South America*. The manuscript for Dr. Gentry's book provided the basis for the keys in the Bolivian tree guide, which assists botanists to identify plants through their vegetative characteristics, without having to see fruits or flowers.

The guide has been already proven to be a valuable resource for botanists, foresters, and other natural resource managers in Bolivia. In addition, Killeen has used it while working in the herbarium on a recent visit to St. Louis as part of his work on an endangered habitat in Bolivia.

TIM PARKER

Pamela Pirio leads a group of teachers through the Japanese Garden in preparation for the Patch Program.

Garden Explorer Patch Program

WHAT do more than two thousand children in the St. Louis area have in common? They have learned about the Missouri Botanical Garden through participation in the Garden Explorer Patch Program. The Patch Program began in 1989. It offers an interactive, focused field trip that explores three distinct areas of the Missouri Botanical Garden: the historical parts of the Garden relating to the life and times of Henry Shaw, the Japanese Garden, and the Climatron. Children who complete the designated activities are awarded a triangular patch.

"The Patch Program evolved from the self-guided tour packet, *The Garden Explorer*, developed by St. Louis Public School teacher Nancy S. D'Arcy, who is on special assignment at the Garden. The idea for this packet came from volunteer Barbara Z. Cook, who was enthusiastic about a similar program at the St. Louis Art Museum and who made it possible for this program to be developed at the Garden," said Pamela Pirio of the Garden's Education Division. Pirio, who developed the Patch Program, is coordinator of the Garden's Stupp Teacher Resource Center.

"We worked with staff from the River Bluffs Girl Scout Council in Edwardsville, Illinois, to make this activity something that would encourage children to love the Garden for life, to have fun, and to stop and look at things which they would customarily pass right by," Pirio said. The patch was introduced first to Girl Scout troops. Soon Club Scouts, school groups, and teachers became interested in the program. The first Cub Scouts to earn the patch visited Tower Grove House, an optional part of the program, where they were fascinated by all the Victorian kitchen machinery. The first school group to earn the patch was from Holy Family School, which is located just south of the Garden on Wyoming Street. The entire staff of the Ferguson-Florissant Early Childhood Center earned the patch in August of 1993.

To prepare groups for the Patch Program, Pirio trains the leaders in a two-hour workshop. "The first half explains how to conduct the activities and provides background information and materials. The second half 'walks leaders through' so that when they return with their groups they are knowledgeable and informed," Pirio explained. "This approach has been very successful, and most leaders who do the first patch return to do the second and third and ask when the next one will be ready," she added. Leaders nominate areas of the Garden they would most like to see become the next patch.

A second patch on the Japanese Garden and a third patch based on the Climatron followed the original Garden Explorer Patch. This spring a fourth patch, based on the English Woodland Garden, will be introduced as soon as renovations in the garden are complete. "Each patch has a special concern. With the fourth one, we wanted to emphasize the Woodland Garden and also focus on the endangered plants growing there. A strong component of this patch is understanding the plight of endangered plants and learning what is being done to prevent their disappearance."

The Garden Explorer Patch Program draws people from the community into the Garden. "The patch builds on the sense of pride and ownership that the Garden represents for so many people," Pirio said. "Perhaps that is why so many people are so dedicated to the program."

Patch Program Workshops are held from 9:30 to 11:30 a.m. on scheduled days. Fees are: $3.50 for the first workshop, $1.00 for subsequent workshops. Call Pamela Pirio at (314)577-9501 for information and registration. -- *Pamela Pirio, Education Division*

Education Division Sponsors American Wetlands Month in May

The fourth annual American Wetlands Month celebrates our natural biological heritage. The world's wetlands support a wide variety of plant and animal populations that depend upon wetlands' unique habitat for food, shelter, and breeding areas. Wetlands form a crucial part of the global biosystem, purifying water by trapping sediment, retaining nutrients and processing wastes. One half of the original 221 million acres of mature wetlands in the lower 48 states have already been destroyed by development, and an additional 290,000 acres continue to be lost every year.

The Garden's Henry Shaw Academy is sponsoring American Wetlands Month for the third year. During May an exhibit of books on wetlands for teachers, students, and interested individuals will be displayed for sale in the Garden Gate Shop. Flyers explaining the importance of wetlands will be available for free. Several Saturday activities for students ages 7 to 9 and 10 to 15 will be offered. The Henry Shaw Academy's year-long classes for older students, Stream Ecology and the Explorer Field Study Program, will explore the Mingo Swamp Wildlife Refuge.

Garden staff members James Trager, Jeff DePew and Jennifer Gleason will help students collect wild plants at Mingo Swamp with permission from the U. S. Fish and Wildlife Service. The following weekend the students will plant the valuable wild species in the newly created wetlands area at Shaw Arboretum to enhance the variety of plant life featured in the habitat and learn first hand about the relatively new science of restoration ecology. The wetlands area at Shaw Arboretum is open to the public.

American Wetlands Month is coordinated by the Terene Institute and the Environmental Protection Agency, Wetlands Division. For more information, write The Terrene Institute, 1717 K Street, N.W., Washington, D.C. 20006 or call the Wetlands Hotline, 1-800-832-7828. For more information about Henry Shaw Academy classes call Jeff DePew at 577-5135.

A Year of the Stream Ecology Program

THE STREAM ECOLOGY PROGRAM, offered by the Henry Shaw Academy (HSA), is a year-long course for students ages 13 to 14. The program gives students the opportunity to study rivers, streams, and watersheds at first hand in a way that encourages their interest and involvement with river ecology. The Stream Ecology Program, now in its fourth year, has consistently enrolled groups of ten students.

During the year, students study the Meramec River on four seasonal canoe trips, learning the fundamentals of canoeing, river camping, and aquatic safety. They use water monitoring and aquatic field research techniques to study the river's biological and chemical health.

Evening classes held at the Garden prepare students for the field trips and allow time for logging their findings into a database and reviewing and analyzing the information they have gathered.

The Stream Ecology Program is part of TERC (Technology Education Research Centers) and GREEN (Global Rivers Environmental Education Network). The program also serves as a foundation for the Missouri Department of Conservation's new high school water monitoring program for Missouri.

Scholarships to HSA

Darnell McCloud, Jillian Morris, and Jeremy Taylor, all aged 14, participated in this year's Stream Ecology Program. All three are students at Mason Investigative Learning Center, a magnet school in St. Louis. The three students applied to the HSA and were chosen on merit to receive full scholarship awards.

Darnell McCloud had no prior knowledge of water monitoring and very little camping experience. He said, "Now if I see problems with the environment and water I will report it or tell someone about it." Darnell hopes to pursue the Stream Ecology Program for two years. He is currently in seventh grade.

Jeremy Taylor said, "You can see the erosion and touch live things in the water. Now I know why water is so important to us." Jeremy, an eighth grader, is preparing to enter Gateway High School next fall.

Students are asked to commit to the continuity of the year-long program of field trips and evening classes, which builds on sequential activities throughout the year. The program runs from September through July. Applications for the 1994-95 Stream Ecology Program are currently being accepted. To request an application with medical form and reference sheets, a schedule, or additional information, please contact Jeff DePew, HSA Coordinator, at 577-5135.

Above: Darnell McCloud experiments with water testing equipment on the bank of the Meramec River.

CLIFF WILLIS

New Signs for the Scented Garden

THIS SPRING, visitors to the Scented Garden will notice a big improvement in the signs for the displays. Shirley Dommer of the Garden's Horticulture Division, who took charge of the project, said, "Over the years we had moved a number of plantings and some of our signs had gotten separated from their plants. We also had added lots of new plants, and it seemed like a good time to upgrade the signs."

Developing 60 new signs was no small undertaking. Shirley had to find a company that specialized in making Braille signs, finally locating Braille-Tac® by Advance Corporation of Saint Paul, Minnesota. Horticultural taxonomist Alan Lievens wrote the text for the new signs, which feature both printed lettering and Braille. Finally, Shirley enlisted the help of staff from the Visually Impaired Program of the St. Louis County Special School District's Applied Technology Division at South Technical High School, who proofed the Braille lettering. Plans are still being developed to upgrade the large central sign.

The Scented Garden is a popular display, with fragrant plantings growing in planters where they can easily be touched and smelled. New plants in the Scented Garden this year include chewing gum mint, *Metha spicata* 'Chewing Gum;' creme de menthe mint, *Mentha requienii*; and root beer plant, *Tagetes lucida*.

LET WORMS EAT YOUR GARBAGE! — In two workshops held at the Kemper Center this spring, elementary school teachers received information and supplies to demonstrate how worms can turn garbage into compost. These clean, wiggly creatures demonstrate decomposition and nutrient recycling and make great classroom pets! This popular program is supported by Monsanto Fund. Above, teachers in a vermicomposting workshop make new friends. Shown from left: Amy Haake, MBG instructor; Gail Pawlitz, Our Savior Lutheran School; Lou Birenbaum, Willowbrook School; and Ann Linenfelser, Madison County Recycling Education Coordinator.

Kummer, McClure, and Nance Are New Term Trustees

THE GARDEN'S BOARD OF TRUSTEES elected June M. Kummer, John W. McClure, and the Reverend Earl E. Nance, Jr., as new Term Trustees at the annual meeting held on January 26, 1994.

June M. Kummer

Mrs. Kummer is a native St. Louisan and a co-founder, with her husband Fred, of HBE Corporation. She received a degree in architecture from Washington University and is now serving as a member of the University's National Council for the School. She has been a member of the Federated Garden Clubs of Missour for over 34 years and just completed a term as district director of the East Central District. She was recently elected first vice president on the State Board and is serving on the National Council of State Garden Clubs as horticulture chairman of improved cultivars. This has evolved into a bimonthly article in *The National Gardener,* entitled, "Come Grow With Me."

Mrs. Kummer has been on the Members' Board of the Garden for six years and served on its executive committee. She said, "The Garden is a mecca for plant lovers from all over the world, and as an avid gardener, I am excited and proud to participate in keeping Shaw's legacy to our city the finest institution of its kind throughout our nation."

John W. McClure is an executive vice president and head of community banking at Mercantile Bancorporation. He is a 23-year veteran of the company and has served in a number of management positions in the lead bank, Mercantile Bank of St. Louis, and its parent company, Mercantile Bancorporation.

John W. McClure

A native of Missouri, McClure is active in civic and professional organizations. He recently served as chairman of the board of trustees of KETC, Channel 9. McClure currently serves on the board of the YMCA of Greater St. Louis and the Missouri Chamber of Commerce. Committed to education, he also serves on the board of trustees of the Academy of the Sacred Heart in St. Charles and the Network of Sacred Heart Schools in Boston, Massachusetts. McClure received his bachelor's degree from the University of Missouri at Columbia.

Rev. Earl E. Nance, Jr.

The Reverend Earl E. Nance, Jr. served previously on the Garden's Board of Trustees as an ex-officio member during his tenure as president of the St. Louis Board of Education, 1991-93. A native of St. Louis, Rev. Nance has been co-pastor of the Greater Mount Carmel Baptist Church since 1979. He was formerly an elementary school teacher in the St. Louis Public Schools. During the campaign for Proposition E last fall, Rev. Nance served as chairman of the campaign committee. Rev. Nance has always been an advocate for education in St. Louis, emphasizing the need for a strong alliance among the city's schools, its cultural institutions, and the community.

At the annual meeting, the Board of Trustees elected Mrs. Raymond H. Wittcoff as a new Emeritus Trustee. She will be profiled in a future issue of the Bulletin. The Garden is delighted to welcome these three outstanding new Trustees to its Board, and looks forward to working with them and benefitting from their expertise.

IN MEMORIAM *Mary E. Baer*

JANUARY 18, 1994, the Garden lost a longtime friend with the death of Mary Eudaley Baer. In 1941 Mrs. Baer founded the St. Louis Herb Society, the first volunteer plant society at the Garden. She was a member of the Garden Club of America and the Ladue Garden Club and was active in activities of the Herb Society until the late 1980s.

Mrs. Baer was married to the late Arthur Baer, head of the Stix, Baer and Fuller department stores in St. Louis. Mrs. Baer was a graduate of the School of Design at Washington University. In addition to other volunteer work she started the Herb Shop at Stix, Baer and Fuller, drawing on her expertise to develop lines of sachets, potpourri, pomanders, fragrant culinary herbs, and other products. She also created many dried plant arrangements for Tower Grove House.

Mrs. Baer was a very special friend of the Garden and she is deeply missed. Memorial contributions may be made to the School of Fine Arts at Washington University or to the St. Louis Herb Society at the Garden.

TIM PARKER

NEW KIEFER MAGNOLIA GROVE — In March the Garden planted eight new adult magnolia trees along the new walkway leading from the Linnean House to the Climatron. The trees, each 20 to 25 feet tall with rootballs eight feet in diameter, were brought in on heavy transports and lowered into prepared holes. The trees were trucked in from New Jersey while still in bud. The Kiefer Magnolia Grove was made possible by a gift from Mrs. Elmer G. Kiefer in memory of her late husband. The beautiful archway of trees creates a new route to the Climatron to relieve pedestrian congestion in the tram loading area.

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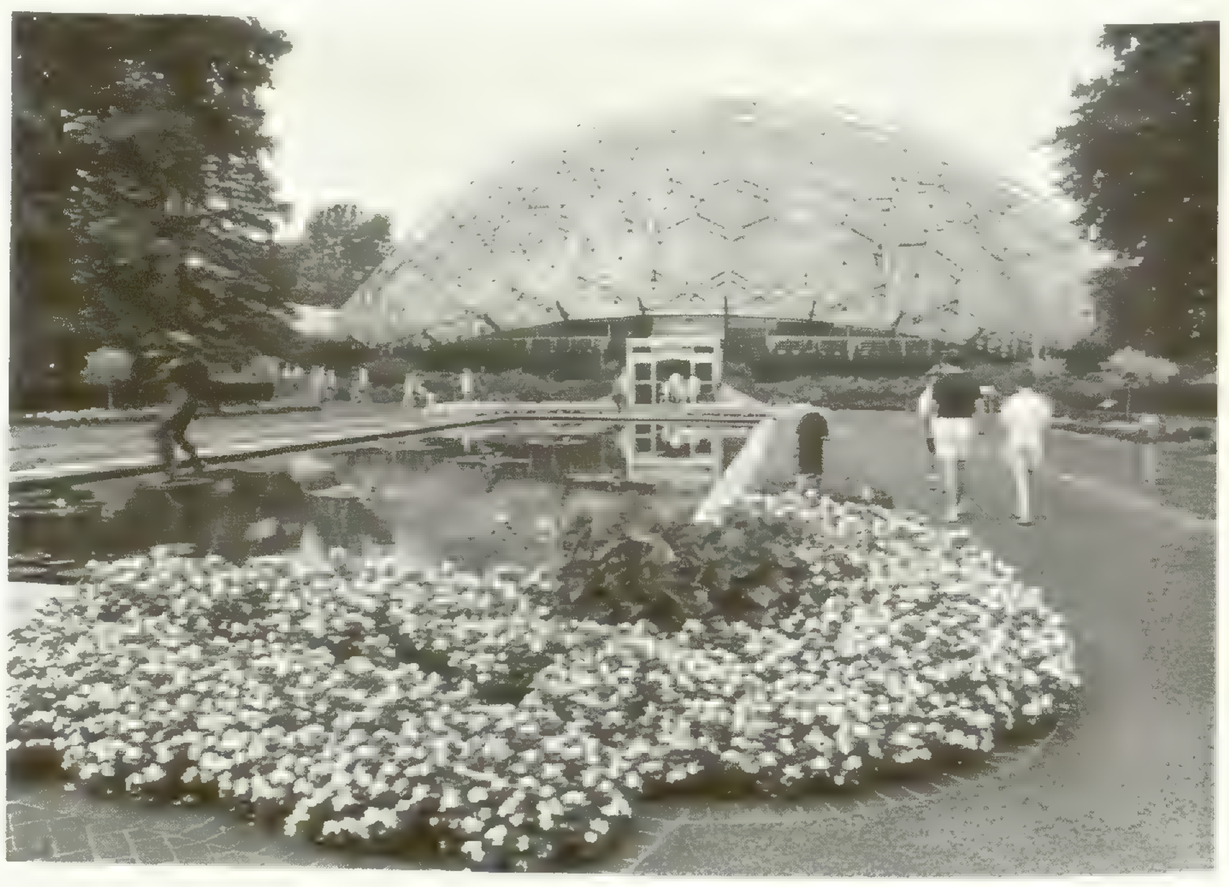

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Join us on the "Yellow Brick Road" to the new Demonstration Gardens at the William T. Kemper Center for Home Gardening!

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Missouri Botanical Garden

JULY / AUGUST
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Comment

MISSOURI BOTANICAL GARDEN MISSION: "TO DISCOVER AND SHARE KNOWLEDGE ABOUT PLANTS AND THEIR ENVIRONMENT, IN ORDER TO PRESERVE AND ENRICH LIFE."

AS YOU WILL READ on the next page, on June 12, 1994 we broke ground for the outdoor demonstration gardens at the William T. Kemper Center for Home Gardening. A major component of our current capital fund drive, the Partnership Campaign, the gardens are the fullfillment of a cherished dream, the completion of the most comprehensive facility for home horticulture in the country. We are eagerly looking forward to watching these beautiful gardens take shape, thanks to the generosity of our members and friends. I especially draw your attention to the special project of the Members' Board to support the construction of the new Entry Court for the Kemper Center, described on page 14. The enthusiasm of our members is a major source of the vitality of the Garden, and I thank the Members' Board for their leadership of this exciting project.

On June 18, just after this issue of the *Bulletin* goes to press, the Garden will host a visit from the Their Majesties the Emperor and Empress of Japan. The royal couple are visiting the United States and especially requested a visit to the Garden and *Seiwa-En* while they are in St. Louis. We are honored to welcome them. Please watch for your September/October *Bulletin* for a complete account of the royal visit.

July and August bring all the beauty of summer to the Garden, along with a delightful array of activities for the whole family. July is "Kids in Bloom" at the Garden, with special films, storytelling, demonstrations, Henry Shaw's Birthday Party, and more, all month long. July 16 and 17, visit the Henry Shaw Cactus Society Show and sale, where you will have an opportunity to purchase some of the display plants from the Desert House, which has been permanently closed until funds can be raised for a replacement facility.

You will notice lots of construction going on in the Garden this summer as the projects of the Partnership Campaign are underway. Make plans to visit the English Woodland Garden, with its beautiful new bog area, streambed, and extended pathways. We know you share our sense of anticipation as we watch the improvements to the Garden take shape and enjoy the beauty of all the areas that are undisturbed. And we hope you will take advantage of our extended summer hours to visit until 8 o'clock on these beautiful summer evenings.

— Peter H. Raven, Director

Union Pacific Gives Land for New Building

CLIFF WILLIS

Richard K. Davidson, president of Union Pacific Corporation (center), stands with Peter H. Raven and Garden Trustee Warren M. Shapleigh (right) on the site of the Garden's new research building at Shaw and Vandeventer. Union Pacific donated a tract of land, a portion of the location for the new building, in honor of Mr. Shapleigh's service as a member of the Board of Union Pacific and a Trustee of the Union Pacific Foundation. "We are delighted that Union Pacific took this opportunity to honor Warren Shapleigh," said Dr. Raven. "It is a splendid gift and a great step toward realizing our plan for the new research facility."

Moving?
Please remember to send us your new address.
To avoid missing any of your membership mailings, we need notification of your new address at least three weeks before you move. Please enclose the mailing label on the back cover of this *Bulletin* and mail to:

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On the Cover

The Jenkins Daylily Garden is in glorious bloom in July and August.

Photo by Jack Jennings

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The BULLETIN is sent to every member of the Garden as a benefit of membership. For a contribution of as little as $45 per year, members also are entitled to: free admission to the Garden, Shaw Arboretum, and Tower Grove House; invitations to special events and receptions; announcements of all lectures and classes; discounts in the Garden Gate Shop and course fees; and the opportunity for travel, domestic and abroad, with other members. For information, please call (314) 577-5118.

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Groundbreaking
for New Demonstration Gardens

On Sunday, June 12, 1994, the Garden inaugurated construction of the outdoor gardens at the William T. Kemper Center for Home Gardening. The first phase of the facility, the William T. Kemper Center building, was dedicated in June, 1991.

The 26 new gardens will include two displays, the Chinese and Boxwood Gardens, which will be built adjacent to the Kemper Center.

Speaking at the groundbreaking ceremony were David W. Kemper, representing the William T. Kemper Foundation, Commerce Bank, Trustee; Catherine Moore, representing U.S. Senator Christopher S. Bond; Rodney Sippel, representing U.S. Representative Richard A. Gephardt; The Hon. Nancy Farmer, State Representative, District 64; and Larry T. Bushong, representing The Hon. Freeman R. Bosley, Jr., Mayor of St. Louis. The Hon. William L. Clay, Jr., State Senator, District 4, The Hon. George R. Westfall, St. Louis County Executive, and The Hon. Stephen J. Conway, 8th Ward Alderman, were unable to attend.

Guests were welcomed by John K. Wallace Jr., president of the Board of Trustees. Dr. Peter H. Raven, director, recognized the contributions of staff, friends, and donors who have made it possible to go forward with the second and final phase of the Kemper Center. Dr. Raven paid tribute to the Urban Gardening Partnership, a collaborative effort of the Garden, University Extension, and Gateway to Gardening, which was formed in 1991 to consolidate resources and activities for gardeners in St .Louis. Centralized information and outreach are offered through the Kemper Center, which is operated jointly by the Garden and University Extension. Dr. Raven also recognized Environmental Planning and Design of Pittsburgh, developers of the Garden's Master Plan; Louis R. Saur & Associates of St. Louis, architects for the Kemper Center; and BSI Constructors, Inc., of St. Louis, construction manager for the Center and the outdoor gardens.

Donors whose generosity has enabled the Garden to move ahead with the demonstration gardens are:

The William T. Kemper Foundation Commerce Bank, Trustee	
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The Sunnen Foundation	*Backyard Garden*
Union Electric Company	*Groundcover Border*
Anonymous	*Fragrance Garden*

PHOTOS BY CLIFF WILLIS

Left: David Kemper (left), Peter Raven, and John Wallace at the groundbreaking.

Above: Friends and well wishers attended the outdoor ceremony.

MISSOURI BOTANICAL

JUN 2 9 1994

GARDEN LIBRARY

Right: The North family, who purchased the Manor House from the Crews family, stand in front of the Manor House, c. 1895.

Below: The Manor House today.

Below, center: Examining the fireplace in the downstairs parlor are (from left): Philip Cotton, (kneeling), David Hicks, and John Behrer.

PHOTOS BY CLIFF WILLIS

Above: Philip Cotton and David Hicks stand in the water tower. The arch below will be reopened as a breezeway. Below: The porch, after restoration.

Manor House
Linking Past & Future

AN IMPORTANT COMPONENT of the Partnership Campaign is the development of the Manor House at Shaw Arboretum as a visitor facility. The 1879 brick mansion stands on a hill with a commanding view of the Arboretum, making it a splendid focal point for the first phase of the new Visitor Center in the Arboretum's Master Plan.

Interpretive Exhibits

The Manor House will house an ambitious display of exhibits that interpret the history of land use in the Meramec River Valley. The Garden is developing the exhibits with assistance from the Missouri Department of Conservation, which made a $300,000 matching grant to support the project. The exhibits will illustrate broad environmental and conservation themes at the Arboretum while highlighting good land management techniques. They are being designed and built by the distinguished team of Condit Exhibits in association with Jack Unruh, design consultant.

The exhibits will occupy the four large downstairs rooms of the Manor House. Major themes will highlight human use of the land, from Native Americans to European settlers; history of the Manor House; the land and its wildlife; and sustaining biodiversity. Great care is being taken to keep the exhibits in harmony with the Manor House and its beautiful natural setting, to emphasize the connection between the Manor House and the land.

Archeological Survey

An exploration of prehistoric sites at the Arboretum may yield exciting displays for the Manor House. This summer, Joseph L. Harl of the University of Missouri-St. Louis will conduct a professional exploratory dig at the Arboretum, with student assistance, in conjunction with East Central College in Union, Missouri. The group will investigate a semi-permanent Native American camp site that was discovered by Arboretum staff plowing an area of fescue several years ago. The site may date from 8,000 to 10,000 B.C. and has already yielded many artifacts such as spear points and arrowheads. An earlier

survey by Harl of the Meramec Valley, including the Arboretum, indicated that additional Arboretum sites may also be of interest. The results of this summer's dig will be incorporated into the interpretive exhibits at the Manor House.

History of the Manor House

An old frame house stood on the homestead of Cuthbert Swepson Jeffries when his daughter Virginia and her husband Thomas W. B. Crews moved there during the Civil War. Crews, a colonel in the Confederate army, became a successful lawyer and prosperous farmer, and in 1879 he built the magnificent Manor House on the site for his wife and their seven children. The old frame house was replaced with a similar structure that served as the kitchen and servants' quarters.

The Manor House, built in the Palladian style with a Victorian accent, had a modern bathroom on each floor, supplied by a water tower located between the house and the kitchen wing. Tall double hung sash windows with curved tops slide up into concealed openings to provide cooling ventilation to the tall central hallway, and door transoms add cross ventilation. Skillful decorative brickwork, marble mantlepieces, and exquisite craftsmanship by woodworkers gave elegance to the house.

From left: John Behrer, Bill Wolverton, and Phil Cotton inspect the site for the aquatic plants portion of the water treatment system.

Renovations

In 1925 the Garden purchased the Shaw Arboretum acreage in Franklin County, which included the former Crews property. The Manor House has been well maintained through the years, retaining its original windows, shutters and flooring, and was used by several former Garden directors as a summer residence. Renovations to permit its use by the public include adding a graded path for wheelchair access, exhibit lighting, air conditioning and heating systems, and remodelling the upstairs rooms for office space. Restrooms and a small kitchen facility will be installed in the frame portion of the House.

The renovations at the Manor House are being supervised by David L. Hicks, the Arboretum carpenter, in consultation with W. Philip Cotton, Jr., an architect noted for his work on historical projects. Mr. Cotton, a native of Columbia, Missouri, graduated from Princeton and earned his M. Arch. degree from the Graduate School of Design at Harvard. He supervised the restoration of the Mark Twain Boyhood Home in Hannibal, the Jefferson Landing in Jefferson City, several projects in Tower Grove Park, and many others in the state, including the Museum Building at the Garden (see page 16). Cotton has received the Flora Place Award and the 1991 Rozier Award from the Missouri Heritage Trust for his work in historic preservation.

"It is important to be sensitive and creative in fitting mechanical and electrical systems into historic buildings with minimum impact," Cotton said. "The Manor House is well suited for use as a public facility, and fortunately the earlier renovations and maintenance have been well done. For example, the electrical conduits installed many years ago are perfectly adequate for the larger systems we need to put in now, which saves a lot of wear and tear. The floors are solid, although we have to add some reinforcement to accommodate the numbers of people who will be using the House. Much of the material we're using has been salvaged from old buildings in the area, which not only ensures authenticity, but helps with the recycling effort."

Environmental Water Treatment

In keeping with the Arboretum's emphasis on environmentally sound conservation practices, the Manor House will have some exciting and innovative features. Wastewater from the restrooms and kitchen will be recycled for irrigation and returned purified to the natural water supply, using an aquatic plant system developed by Dr. B. C. Wolverton.

For 25 years Dr. Wolverton, formerly a scientist with NASA, has directed research on the use of plants and microorganisms for treating sewage and industrial wastewater. He pioneered the use of plants for indoor air pollution abatement and has supervised aquatic wastewater purification systems for communities throughout the United States.

"These systems not only work well for rural areas and small municipalities, they are much cheaper to build and maintain than conventional water treatment plants," said Dr. Wolverton. John Behrer, manager of Shaw Arboretum, pointed out that the facility at the Manor House would serve as an educational display as well. Wastewater will be led from the House to a holding tank to an outdoor field, where plants and the microorganisms associated with their root systems will break down and remove organic chemicals. "This is proven technology that is safe, effective, inexpensive, and odorless," said Behrer. "We are glad to be able to introduce it in such a visible way."

Geothermal Heating

The Manor House will also benefit from the use of geothermal heat pumps for its heating and cooling systems. Geothermal systems utilize the natural solar energy absorbed by the ground, which keeps soils at a certain depth at a constant temperature of approximately 52 degrees F. regardless of the season. Burying a closed loop system of pipes in the ground and circulating water through it allows for extremely efficient heating in winter and cooling in summer. "This technology is not new," said Behrer. "Although the up-front costs are higher than for conventional systems, they will pay for themselves in time. With heating, cooling, and water heating consuming over 50 percent of home energy use in the United States and Canada, geothermal systems offer significant longterm benefits."

David Hicks stands in one of the windows in the upper hall.

Opening

Renovations are currently underway at the Manor House and are scheduled to be finished in late 1995. The exhibits are being designed, and installation will take place when the renovations are complete. ■

The Ruth Palmer Blanke Boxwood Garden

A NAMING GIFT from Mrs. Albert G. Blanke, Jr. has enabled construction to begin this year on the Boxwood Garden. Ruth Palmer Blanke chose the quotation from Voltaire's Candide "Il faut cultiver notre jardin" to be engraved in the stones set in the paving at the entrance to the new garden named in her honor.

"We must cultivate our gardens," said Candide. "You are perfectly right," said Pangloss. "When man was put into the Garden of Eden he was put there so that he should work it. This proves that man was not born to take his ease."

The selection of this message by Mrs. Blanke for the dedication of this garden is appropriate on several levels. Clearly, it reflects the creed that she follows in her daily life as she tends the gardens at her home in St. Louis, Hobe Sound, and New York. A deeper meaning of this message is to see "cultivation" synonymous with "enrich". Ruth and her late husband, Bert, have enriched the community and the Missouri Botanical Garden through their generous financial support over many years. Another interpretation of this quotation is to see "gardens" synonymous with "life". Certainly, Ruth's generosity enriches her life and ours.

Dr. Raven remarked, "We are absolutely delighted that Ruth has chosen such an outstanding commemoration. The Blanke Boxwood Garden is a long-planned and magnificent addition to our display program, and it is indeed fitting that it memorializes such a great friend of the St. Louis community."

From left: Doug McCarthy, Ruth Blanke, and Charles Freeman at the site of the new garden.

The entrance to the 1.6-acre garden is a small contained court, the main feature of which is a bronze sculpture of a swan nestling in a bulrush and cattail marsh. This piece was fabricated by sculptor Jeff Schiff of Winthrop, Massachusetts. A garden bench is also provided, and the entire entrance is surrounded by tall brick walls. There are glimpses out through window openings to the core of the garden, but the full extent of the design is hidden from view. The entry walk winds around to the north between brick walls, screened from the main garden by vine-covered trellises. The walk is flanked by boxwood and perennial borders displaying part of the Garden's collection of boxwood.

At the center of the garden is a formal oval boxwood parterre. The pattern of the parterre forms the initials of Henry Shaw and the design is infilled with ground covers and flowers.

To complement the formality of the oval parterre, the designers of the Boxwood Garden have surrounded the clipped and manicured oval with boxwood borders, informally planted to show off the collection and to provide a framework for the garden. These will be allowed to grow naturally to display their form. The taller box will be used in combination with other plants to screen the garden from the surrounding gardens and to give the center of the garden a feeling of peace and solitude.

When the visitor reaches the main axis of the garden, the full design is finally revealed. At the far end of the garden is a pattern of fountains with random jets leaping into the air and arching over the paths, interspersed with round pools of water with continuously playing vertical jets of water. The leap frog jets can be set to create all sorts of different patterns. Behind the fountains is a low brick retaining wall topped with urns of flowers. This wall serves to nestle the garden into the existing mound on the site setting it off from the Japanese Garden beyond.

The main walk continues around to the east side of the garden, leading to a pavilion that sits up on a small mound overlooking the pattern of the garden. The pavilion will be paved with blue stone and furnished with small tables and chairs, a quiet place to sit in the shade and enjoy the view.

A secondary lawn path winds

An architect's rendering of the new Boxwood Garden

out from the pavilion to the north and into an area for additional boxwood borders. These borders have been laid out in informal flowing beds surrounded by lawn. There are benches tucked into this area, a good place to get out of the main flow and study the plants. In addition, a path has been provided from the pavilion to link the Boxwood and the English Woodland Garden.

Mrs. Blanke has been an active participant in the design phase and reports that she is thrilled with the architectural and horticultural plans. "They have included everything that I love to have in my own gardens. Best of all, the garden staff will tend it while we enjoy it."

Boxwood Society Celebrates 25 Years

ON MARCH 28, 1994, the Boxwood Society of the Midwest celebrated its 25th anniversary at its annual meeting at the Garden. For the past quarter century the group has met every Wednesday from April through October to help maintain the Garden's boxwood collection. Today their numbers include members from all over the United States, who enjoy an annual newsletter edited by Mary Gamble. In honor of their anniversary, the members of the Boxwood Society gave the Horticulture Division a four-volume set of *The New Royal Horticulture Society Dictionary of Gardening*, in tribute to the memory of the Society's mentor, Dr. Edgar Anderson.

The late Dr. Anderson, a former director of the Garden, was a botanist whose distinguished career included service to the Arnold Arboretum of Harvard University, Washington University and the Missouri Botanical Garden, among others. In 1969 his appreciation for boxwoods inspired a study group of members of the St. Louis Herb Society, which evolved into the Boxwood Society of the Midwest.

In 1934 Dr. Anderson visited the Balkans to collect boxwood cuttings and seedlings that he hoped would prove hardy in the midwestern U. S., where *Buxus* is notoriously difficult to grow. *Buxus sempervirens* 'Varder Valley', a variety from a region where the climate is identical to that of St. Louis, proved to be particularly successful. A number of plants grown from Anderson's specimens remain on display at the Garden and at Shaw Arboretum, where visitors can see how different varieties come through our harsh winters and hot summers.

The Garden's Boxwood Nursery is temporarily located on the west side of the Garden behind the Kemper Center. With the creation of the Ruth Palmer Blanke Boxwood Garden, these beautiful plants will at last have a proper setting. Thanks to the devoted efforts of the Boxwood Society, the tradition of growing boxwood in the Midwest is thriving.

CLIFF WILLIS

New Streambed Takes Shape

LANDSCAPE DESIGNERS Karl Pettit, above left, and Matt Moynihan are shown supervising placement of limestone boulders in the streambed constructed this spring in the English Woodland Garden. The new brook is an extension of the existing stream that empties into the Japanese Garden. Pettit worked with the late Koichi Kawana, designer of *Seiwa-En*, during construction of the Japanese Garden, which was dedicated in 1977.

More than 400 limestone boulders of various sizes were installed along a 220-foot concrete liner. The stones are from the Casper Farm of Jonesburg, Missouri, who supplied the stones for the two waterfalls and streams in *Seiwa-En*.

The new stream was designed by Environmental Planning and Design of Pittsburgh as a low-volume, gently bubbling brook, two to three feet wide, flowing from a pool at the east end of the Woodland Garden. The stones were carefully placed to look entirely natural, concealing the concrete liner and extending into the surrounding landscaping.

Pettit, now with the Hillier Group of Philadelphia, formerly worked for Mackey Mitchell Associates of St. Louis, designers of many of the Garden's most beautiful features. Moynihan & Associates of St. Louis supervised the placement of the stones in the new steambed.

CLIFF WILLIS

NEW PATHS PROVIDE EASIER ACCESS — People with disabilities will find the English Woodland Garden easy to enjoy thanks to new paved paths. Here two visitors enjoy the new bog area established this spring at the south end of the English Woodland Garden. The bog features a quiet pool surrounded by plants that thrive in wet soils or aquatic habitats. The English Woodland Garden has been supported in part for many years by family and friends in memory of Adelaide La Beaume Cherbonnier and Edward Cherbonnier.

Partnership Campaign Update

Million Dollar Donors Support Research Facility

The Partnership Campaign, the Garden's capital fund drive, has moved closer to its goal thanks to major support from four local corporations. The centerpiece of the campaign is the new research building, which will provide urgently needed space for the Garden's research activities, herbarium, and library. Other components of the campaign are 26 outdoor demonstration and display gardens that will complete the Kemper Center for Home Gardening and surrounding areas; the renovation of the historic Manor House at Shaw Arboretum as a display facility; completing permanent educational exhibits for the Brookings Interpretive Center; acquiring a historic set of Chinese botanical specimens; and renovating the 1849 townhouse at the Garden as an administrative facility.

Emerson Electric Co. Supports New Conservation Center

In addition to the campaign components above is the Emerson Electric Co. Conservation Center, which opened in June, 1993 as the headquarters for the Garden's programs in public and conservation horticulture and the Gateway to Gardening Association, an important community partner. The majority of a $1 million gift from Emerson Electric Co. to the Partnership Campaign capped fund raising for the building and provided the naming gift. This contribution was also significant in that it allowed the Garden to complete a $500,000 challenge grant from The Kresge Foundation for the project.

Dr. Peter H. Raven observed, "This energy-efficient, cost-saving structure permits us to bring staff together with their local, national, and international colleagues working in the critical areas of conservation and community greening. We are thrilled that the Emerson Electric Co. has allowed us to acknowledge their ongoing generosity to the Garden in this way."

Charles F. Knight, chairman and chief executive officer of Emerson Electric Co., said, "The Partnership Campaign, and the new conservation center in particular, are very important to the future of the Garden and of St. Louis. The Garden's mission to promote the understanding of plants in the environment is crucial, and we are delighted to support it in this meaningful way."

Monsanto Fund Makes Lead Gift

Through a pledge of $1 million, Monsanto Fund has made the lead gift toward the construction of the new headquarters for the Garden's research program. The $1 million contribution was the first designated for the project.

Monsanto Fund is the philanthropic arm of Monsanto Company, an international corporation headquartered in St. Louis. This gift continues a tradition of more than three decades of generous support by Monsanto for the Garden. In that time, approximately $3.5 million has been contributed by the Fund and the Company for special projects, research efforts, and in the form of employee matching gifts. Two features at the Garden have been named in honor of past significant donations: Monsanto Hall, the large, barrel-vaulted space in the Ridgway Center, and the Monsanto Gallery, the main exhibit hall in the William T. Kemper Center for Home Gardening.

Dr. John L. Mason, president of Monsanto Fund, said, "This grant represents our continued support of the Garden's excellence in providing leading technology in support of environmental projects critical to our quality of life."

Dr. Peter H. Raven, director, said, "It is my very special pleasure to acknowledge this latest generous gift from Monsanto Fund, in light of our long and close relationship based on mutual efforts to promote the proper and beneficial use of plants to society, and thus our mutual concern for conservation of species and habitats."

The May Department Stores Company

A $1 million contribution from The May Department Stores Company and its Famous-Barr, Lord & Taylor, and Payless ShoeSource stores has brought the Garden's capital fund drive to more than half of its $29.5 million goal. May Company's contribution will help fund the new headquarters for the Garden's research division.

In announcing the $1 million dollar gift, May Company's chairman and chief executive officer David C. Farrell said, "We are very pleased to continue our support of the Missouri Botanical Garden through this Partnership Campaign. In addition to serving the St. Louis area, the Garden provides international leadership in the conservation of plant species and furthering an understanding of natural habitats. The new facility for research will enhance the Garden's efforts."

Dr. Peter H. Raven commented, "It is with profound pleasure that we announce this wonderful contribution. The May Company's investment in our research work is very gratifying, and we are deeply appreciative of their support."

The Anheuser-Busch Foundation

The Anheuser-Busch Foundation is donating $1 million, payable over seven years, to the Partnership Campaign. "Anheuser-Busch has long been a good friend of the Garden, and this generous donation is yet another example of the important role the company plays in our community," said Dr. Peter H. Raven.

August A. Busch III, chairman of the board and president of Anheuser-Busch Companies, Inc., said, "We are proud to be able to assist in keeping this St. Louis institution a leader in the world's research on biological diversity. This work is important to us and also to future generations."

Anheuser-Busch Companies, Inc., and its charitable foundations have demonstrated commitment to education and the environment with contributions of more than $28 million to nonprofit organizations during 1993. The donations typically are made to support a wide range of activities in communities where the company operates major facilities. In addition, contributions are made throughout the country to assist in minority development and to fund alcoholism research and programs to combat alcohol abuse. ■

YOU & THE

ENVIRONMENT

Department of Natural Resources Supports New Composting Facility

THE Missouri Department of Natural Resources (DNR) has provided support for the Garden's new Home and Small Scale Municipal Compost Demonstration Site, a facility under construction this summer just north of the Kemper Center for Home Gardening.

"The Garden has been a leader in public education about composting in the state," said Dr. Steven D. Cline, manager of the Kemper Center. "With Missouri now banning yard waste from landfills, composting for homeowners and small municipalities is more important than ever. The generous support from the Department of Natural Resources will allow us to expand our facilities for educating the public and improve the Garden's own composting program."

In 1991 the Garden began the Master Composter Program, supported by Monsanto Fund. To date the program has trained 100 volunteer instructors who have in turn lectured to more than 5,000 citizens about yard waste management; has established five demonstration sites in conjunction with St. Louis County Department of Parks; and implemented a hotline to answer questions by telephone. With continuing support from Monsanto Fund, the Master Composters develop programs with schools, train more volunteer instructors, and are expanding their compost bin distribution program.

The DNR grant will allow the Garden to build a public demonstration area on the one-third acre site currently used for composting waste generated on the grounds. Because the Garden's 79 acres produce a high volume of yard waste, the new facility will present techniques for managers of small municipal compost sites as well as training for homeowners. Interpretive signs and model backyard composting units will be displayed on the site.

In addition, the DNR grant will allow the Garden's Adult Education Program to offer five new courses dealing with composting and landscaping to minimize yard waste, in both spring and fall, plus two workshops for managers of municipal composting sites of less than two acres. All classes will utilize the new facility.

Finally, the Garden will be able to expand its "Hortline" touch tone telephone service for the public. The 24-hour service will add four new phone lines to provide easy access to recorded information on yard waste management and a variety of environmental issues including recycling of paper, cardboard, glass, automotive oil, and more.

"We are excited about the new facility and the expanded services it will provide for the public," said Dr. Cline. "It is crucial that we all become more knowledgeable about ways to reduce the amount of waste in our landfills. This support from the Missouri DNR will help us to continue to take a lead in educating people about these issues."

CLIFF WILLIS

Shown in the Climatron with John MacDougal, MBG conservatory manager (right), are Christine Hoffman and Ron Lance of TNCA.

VISITORS FROM NORTH CAROLINA ARBORETUM — This past spring the Garden participated in a series of staff exchanges with the North Carolina Arboretum (TNCA) of Asheville, North Carolina, under a grant from the Institute of Museum Services, a Federal agency. TNCA, a participating institution of the Center for Plant Conservation, was one of seven organizations that received the IMS Leadership Initiatives Awards.

"The project will establish a national model for strategic mentoring that fosters collaboration and management support,"said George Briggs, executive director of TNCA. "It will be especially valuable to us in our role as mentor to small gardens...in rural areas where access to management insight is limited or nonexistent."

Michael Olson, the Garden's controller, and Tina Pey, MBG horticulturist, visited TNCA earlier this year. In April, TNCA sent Eden Foster, education, Christine Hoffman and Ron Lance, nursery and greenhouse management, to the Garden. "These kinds of professional exchanges are helpful and a good experience for all of us," said Dr. Shannon Smith, MBG director of horticulture.

JACK JENNINGS

CHINESE GARDEN STONES SELECTED — Lei Li, senior landscape architect and chief engineer for the Nanjing Municipal Bureau of Urban Parks and Open Space Administration (third from left), visited St. Louis in May to consult on plans for the new Chinese Garden. Together with Garden staff and Yong Pan, the architect for the project, Madame Lei visited SEMCO Distribution Company in Perryville, Missouri, to select boulders to be used in the landscaping. Portions of the Chinese Garden will be constructed at the Garden in coming months with support from Nanjing, China, a sister city of St. Louis. Shown at Perryville are (from left): Yong Pan; Paul Brockmann, MBG director of general services; Lei Li; Nancy Tai, Flora of China project; Ziping Cen, a horticulture intern at MBG, formerly a horticulturist at the Shanghai Botanical Garden; and Kevin Thieret of SEMCO.

HONEYBEES: WORLD CHAMPION POLLINATORS

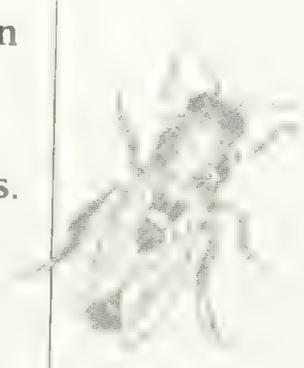
THE ASTOUNDING SUCCESS of the flowering plants that we see today is the result of their ability to form mutually beneficial relationships with insects. For hundreds of thousands of years, plants and insects have been shaping each other to such a degree that today some plants are totally dependent on only one species of insect for their survival.

The honeybee, Missouri's state insect, has evolved to become the world champion pollinator and pollen collector. Flowering plants provide food for the honeybee in the form of pollen and nectar; the bees spread pollen among the flowers they visit, allowing the plants to produce seed and secure the next generation. Honeybees tend to confine their attention to one flower species during a single foraging trip, but they move from plant to plant, favoring cross-pollination. Cross-pollination results in greater genetic variation, which can mean stronger, more vigorous plants.

Crops and Flowers

About 15 percent of the cultivated food plants in the U.S. depend upon or benefit from insect pollination. Bees are a main pollinator of fruits, nuts, and cotton. Bees also pollinate alfalfa, clover, lespedeza, and trefoil. These plants fix nitrogen in the soil, reducing the need for chemical fertilizers.

Honeybees do amazing amounts of work to make orchards and home gardens more productive. They increase the yield on all gourds, including cucumbers, squashes, melons and pumpkins, and on all plants that flower before setting fruits or vegetables. Ninety percent of the productivity of strawberry plants depends on the activity of bees. Some favorite herbaceous flowering plants that attract honeybees to the home landscape are salvias, snapdragons, bee balms, sunflowers, candytufts, lantanas, allysum, cosmos and foxgloves. Bees are also attracted to the fragrance of herbs such as lavender, rosemary, and thyme.



Shape and Color

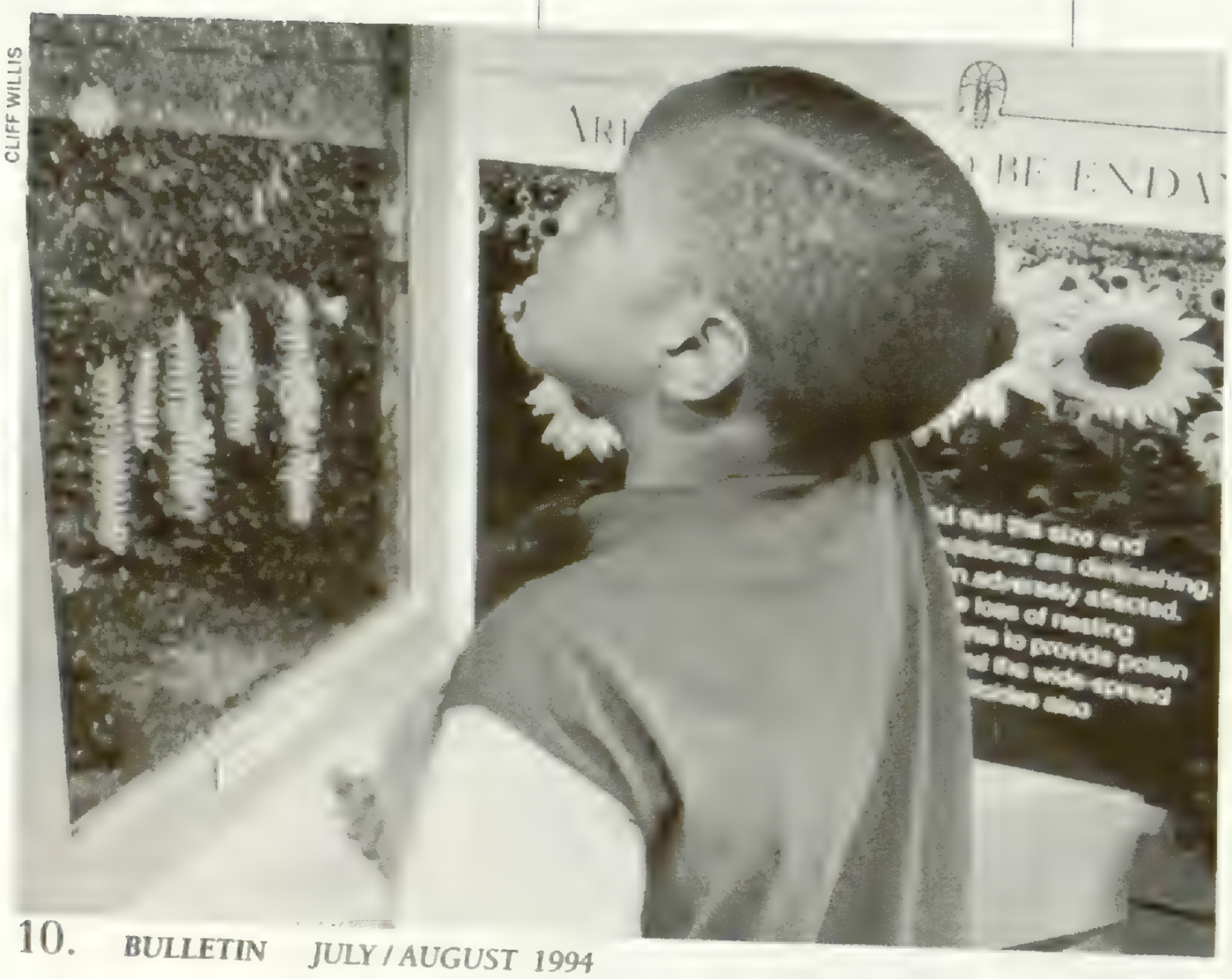
Bee-pollinated flowers tend to be brightly colored blues and yellows. Bees see red as gray or as an absence of color; bees who are visiting a red flower are probably seeing ultraviolet markings invisible to us which serve as directional pointers to the source of the nectar.

Flower shape and color guide bees from a distance, and scent provides the stimulus to alight. Bees are attracted to the blooms with the highest sugar concentration; nectar with a high water content is not worth the energy spent to collect it.

The Honeybee Colony

A colony of honeybees consists of several thousand workers, a few hundred drones, and a single queen. The survival of the colony depends on the labor of individual bees.

CLIFF WILLIS



An external entrance to the hive allows the bees to visit flowering plants in the area.

A colony of Italian honeybees,* Apis mellifera ligustica, *were chosen for their gentle nature and took up permanent residence in a new observation beehive display at the Kemper Center in April of this year. The honeybees were provided by Jim Buxton and the Jefferson County Beekeepers Association and are being maintained by beekeeper and Master Gardener Mary Reed.

The queen's sole purpose in life is to lay eggs. A queen will lay an average of 1,500 eggs per day during the summer, and from 175,000-200,000 per year. Fertilized eggs become workers or queens, and unfertilized eggs become drones. Drones are the males, and they are maintained in a hive for the sole purpose of mating with a queen, after which they die.

Worker bees are aptly named, as they are responsible for most of the maintenance chores in the hive. Young worker bees develop wax glands in their heads used for sealing cells and building comb.

Older worker bees receive pollen and nectar from foraging bees. The nectar, stored in their honey-stomachs, is passed from bee to bee. During this process, an enzyme is added to the condensed nectar, converting it to honey. A good colony will produce about 60 pounds of honey to feed the colony in winter and approximately 50-100 pounds of surplus honey for the beekeeper.

When the worker bees are about three weeks old, they will begin to forage. Bees forage for pollen, nectar, water and plant resins used to plug or reduce openings in the hive. Water is used to cool the hive and dilute the honey consumed by bees. Pollen is mostly used to feed immature bees.

Threats to the Honeybee Population

Beekeepers have noted that the size and diversity of bee populations are diminishing, adversely affecting crop pollination. One likely reason is the loss of nesting places and wild nectar plants to provide pollen sources.

Today one of the major threats to beekeeping in the U.S. is from herbicides sprayed on wild plants and pesticides sprayed on food or textile crops. In many states where agriculture is big business, it has become virtually impossible to keep bees because of aerial spraying of pesticides.

If beekeepers are given advance warning, they can close down the hives the night before and keep bees out of the field or orchard for 24 hours, which allows most of the chemicals time to break down. In the home garden, use spray applications instead of dusts and apply when plants are not in bloom or late in the day when the bees are not out. Be certain to use insecticides less toxic to bees and with a short residual time whenever possible.

— Katie Belisle, Kemper Center for Home Gardening

Hortline Answers Your Gardening Questions 24 Hours a Day!

You don't have to wait to get through to the Horticultural Answer Service—Hortline can answer your gardening questions any time of the day or night. All you need is a touch tone phone and a brochure listing the hundreds of topics recorded on Hortline. Recorded messages produced by the Garden provide a wealth of information on all gardening topics — just a phone call away! To pick up a brochure, stop in the Kemper Center for Home Gardening between 10 a.m. and 4 p.m. daily, or call (314) 577-9440. If possible, please send us a self-addressed, stamped envelope. We will be happy to mail a Hortline brochure to you.

TELEPHONE HELP

The Garden has several telephone services available to assist you.

GardenLine **577-9400**
24-hour recorded information about Garden events, hours, admission and directions. Outside area code 314, call **1-800-642-8842** toll free, 24 hours a day.

Horticultural Answer Service (314)577-5143
Monday through Friday, 9:00 a.m. to noon, Master Gardeners are on hand to answer your gardening questions.

HortLine **(314) 776-5522**
24-hour recorded gardening information is available with a touch tone telephone. You will need a brochure listing the hundreds of HortLine topics in order to use the service; you may request a brochure by calling the Kemper Center for Home Gardening at (314) 577-9440, 10 a.m. to 4 p.m. daily. **Plants in Bloom at the Garden** is updated weekly. Press 3 when you call HortLine.

Master Composter Hotline (314) 577-9555
9:00 a.m. to noon, Monday through Friday. Specially trained Master Gardeners are on hand to answer your questions about yard waste management techniques. After hours leave a message and your call will be returned. The Master Composter program is supported by the Monsanto Fund.

The William T. Kemper Center for Home Gardening is open 10 a.m. to 4 p.m. daily.

The Plant Doctor is available at the Kemper Center for walk-in consultations from 10 a.m. to noon and 1 to 3 p.m. Monday through Saturday.

Admission to the Kemper Center is free with regular Garden admission. For information on classes and activities at the Center, please refer to the Adult Education brochure mailed to all members, or call 577-9440.

Calendar

Kids in Bloom – July Is Children's Month at the Garden

Enjoy a variety of events planned especially for children and their families throughout the month of July. All Kids in Bloom activities are free with Garden admission unless otherwise noted. Admission to the Garden is always free for children age 12 and under. For information on any Kids in Bloom activity, call 577-5125.

july 1 — august 1

Operation Brightside Exhibit

9 a.m. to 8 p.m. daily, Ridgway Center. Third and fourth graders from the St. Louis area have cleaned up the litter from around their schools and used it to create works of art.

july 7 thursday

Kids in Bloom: Grandparents' Day

9 a.m. to 8 p.m. Free admission and free MoBot Express Tram rides for grandparents accompanied by their grandchildren.

Kids in Bloom Film Festival: "Aladdin"

11 a.m., 1:30 and 7 p.m., Shoenberg Auditorium. Featuring a different film every Thursday in July. Seating is limited. All seats are $1.50.

july 9 saturday

Kids in Bloom: Bee Demonstrations

10:30 and 11:30 a.m.; 1:30 and 2:30 p.m., Kemper Center for Home Gardening. Did you know that a queen bee will lay an average of 1,500 eggs a day? Or that bees dance to help them find food? Come see what all the buzz is about at the Kemper Center's new observation beehive. Experienced beekeepers will be on hand with more interesting facts about Missouri's state insect, the honeybee.

july 11 monday

Kids in Bloom: Once Upon a Time

10 a.m. to 4 p.m., Ridgway Center and grounds. Fairy tales, legends, myths, tall tales, and music from storytellers, children's theater companies, and musicians for a day of imaginative entertainment. Performers include TV's Annette Harrison and Chicago's Child's Play Theater.

july 14 thursday

Kids in Bloom Film Festival: "Babes in Toyland"

See July 7 for details.

july 16 saturday

Kids in Bloom: Bee Demonstrations

See July 9 for details.

july 16 – 24

saturday – sunday

Henry Shaw Cactus Society Show

9 a.m. to 5 p.m. daily, Orthwein Floral Display Hall. The 49th annual show and plant sale features a wonderful array of cactuses and succulents, including selections from the MBG Desert House, which has been closed. Free with Garden admission.

july 18 monday

Plant Clinic

10 a.m. to noon, Kemper Center for Home Gardening. Master Gardeners provide on-the-spot identification of plants and diagnosis of pests and problems. Free with Garden admission.

july 21 thursday

Kids in Bloom Film Festival: "Snow White and the Seven Dwarfs"

See July 7 for details.

july 23 saturday

Kids in Bloom: Puppets Galore!

10 a.m. to 4 p.m., Ridgway Center and grounds. The day begins with a puppet parade across the Garden and continues with performances by some of the nation's best puppet companies.

july 23 saturday

Kids in Bloom: Nature Masks

10 a.m. to 3 p.m., Kemper Center for Home Gardening. Be a part of the Puppets Galore Celebration! Stop in at the Kemper Center and make a mask out of natural materials collected at the Garden.

july 24 sunday

Kids in Bloom: Henry Shaw's Birthday Party

10 a.m. to 2 p.m. Celebrate the 194th birthday of the Garden's founder Henry Shaw as WFUN-AM radio broadcasts live from the Garden. Musicians and storytellers, the amazing Maze, and Henry Shaw himself will be on hand for fun and entertainment. Birthday cake will be served at 1 p.m.

july 27 wednesday

"I Love Eating" Class

11 a.m. to 12:15 p.m., Kemper Center for Home Gardening. Today's topic: "The Miracles of Antioxidants...Eating Your Way to Health and Beauty." Let nutrition experts take you through the pro's and con's, and savor recipes naturally rich in antioxidants. Sponsored by the Garden in conjunction with the American Heart Association and the Missouri Soybean Merchandising Council. Classes and admission are free, but reservations are required: please call 45-HEART or 1-800-255-9919 to register.

july 28 thursday

Kids in Bloom Film Festival: "Who Framed Roger Rabbit?"

See July 7 for details.

july 29 friday

Kids in Bloom: A Child's Japanese Festival

10 a.m. to 4 p.m., Ridgway Center and grounds. Give children an introduction to Japanese culture with music, arts & crafts, food, and tours of Seiwa-En, the Japanese Garden.

july 30 saturday

Kids in Bloom: Terrariums

10 a.m. to 3 p.m., Kemper Center for Home Gardening. Create your own miniature botanical garden under glass! Visit the Kemper Center and make a terrarium to take home and enjoy.

july 31 sunday

Iris Rhizome Sale

11 a.m. to 5 p.m., Ridgway Center. The Greater St. Louis Iris Society holds its annual sale of surplus rhizomes from irises grown at the Garden. All proceeds benefit the Missouri Botanical Garden. Come early for best selection!

august 1 monday

Plant Clinic

See July 18 for details.

august 15 monday

Plant Clinic

See July 18 for details.

august 29 monday

Slide Presentation: "Treasures from the Kingdom of Fungi"

7:30 p.m., Shoenberg Auditorium. Join photographer Taylor F. Lockwood of Mendocino, California, for a new perspective on the natural world through the beauty and diversity of mushrooms and other fungi. This program of stunningly beautiful photographs, cosponsored by the Garden and the Missouri Mycological Society, has been acclaimed by the Audubon Society and the Sierra Club. $3 per person, at the door.

Plant Clinic

See July 18 for details.

september 3 – 5

saturday – labor day

20th Annual Japanese Festival

See back cover for details.

Members' Days

july 12 tuesday

"Don't Let Them Bug You"

7 p.m., Shoenberg Auditorium. Ken Miller, owner of The Bug Store, will introduce you to exciting methods of chemical-free pest control for lawn and garden. Achieve an environmentally friendly garden that affirms your commitment to a healthier home and community. Drawing for attendance prize. Seating is limited. Free, for members only.

august 6 saturday

Dawn Photo Walk

5:10 a.m. Bring your camera, get a cup of complimentary coffee, and capture your favorite Garden scenes at sunrise. Free, for members only.

every day

Free Walking Tours

1 p.m. daily. Meet the Garden Guides at the Ridgway Center ticket counter, rain or shine, for a fascinating tour of the Garden. Free with regular admission.

wednesdays & saturdays

Garden Walkers' Breakfast

7 a.m., grounds. In cooperation with the American Heart Association, the grounds open early every Wednesday and Saturday morning to encourage fitness walking. Greenhouses open at 9 a.m. Breakfast is available for purchase in the Gardenview Restaurant, 7 to 10:30 a.m. Admission is free on Wednesdays and Saturdays until noon.

Coming in October

The Third Annual

"Best of Missouri" Market

Sunday, October 9, 1994

Rural Missouri visits St. Louis! Join us for our crowd-pleasing celebration of the best of Missouri foods, specialty products, handicrafts, plants, music, displays, children's activities, and more! It's fun for the whole family, all day long. Watch for more details in your September *Bulletin*.

Members

A Members' Nature Expedition

Wildflowers and National Parks of Southern Chile

January 7 – 20, 1995

Co-sponsored by the Missouri Botanical Garden and Adventure Travel

Chile, a safe, friendly and stable country sometimes referred to as the Switzerland of Latin America, is a land of soaring mountain ranges dotted with spectacular snow-capped volcanoes. The trip will be led by the Garden's director of education, Dr. Larry E. DeBuhr. Local botanical guides will join the group at all points during the trip.

The trip begins in the capital, Santiago, and travels south to Punta Arenas, one of the southernmost cities in the world, situated on the shores of the Straights of Magellan. In Santiago, visit a private garden and dine at traditional Chilean restaurants. At the seaside city of Puerto Montt, spend the next several days exploring the wonders of the spectacular Puyehue National Park, Petrohue Water Falls and the Vincent Perez Rosales National Park, the most scenic of all of Chile's southern natural areas. Explore the gorgeous Los Alerces National Park with its striking view of Volcano Calbuco. Fly south to Punta Arenas near the southern tip of South America and drive across the steppes of Patagonia to the Torres del Paine National Park.

The tour includes an optional five-day excursion to the legendary and mysterious Easter Island. This archaeological enigma, 2000 miles off the coast of South America, is covered with more than 600 giant stone statues up to 32 feet tall and weighing over 90 tons. The island, studied for decades, yields more questions than answers.

For more information about this exciting trip, please call the Education Division at (314) 577-5140 or Adventure Travel at (314) 863-7474.

Members' Board Achieves Leadership Goal

Follow the Yellow Brick Road!

IN A RECENT MAILING, all Garden members were invited to "Follow the Yellow Brick Road"— an opportunity to see their names inscribed on engraved bricks in the circular path of the new Entry Court at the Kemper Center for Home Gardening. The Court will be the gateway for visitors to the Kemper Center and the new outdoor demonstration gardens.

Members are invited to participate in the Entry Court project on a wide variety of gift levels. There are a range of naming gifts available, and significant gifts can be arranged as pledges of up to five years.

- For each donation of $300, the Garden will place a clay brick engraved with the name of your choice — a great way to honor those you love as well as having the fun of partipating yourself.
- Contributions of $1,000 will be recognized with a special bronze "brick."
- Donors of gifts of $50 or more also will be recognized in a roster of contributors on a computer kiosk that will be placed in the Kemper Center.

Halfway Mark Is Reached

As this *Bulletin* goes to press, individuals on the Members' Board have contributed $124,230 in leadership gifts for the Entry Court, representing 99.39% of the Members' Board goal of $125,000. The Board has challenged Garden members to participate in the special project by contributing an additional $130,000, for a total of $255,000 needed to support the naming gift for the Entry Court.

The committee in charge of the drive is chaired by James Goggins. Committee members are Mrs. Robert Tschudy, Michael W. Cole, Joe J. Curtis, and Mrs. R. Hal Dean. The Members' Board is to be congratulated on its leadership and for challenging the members to help realize the dream. Watch for reports on our progress!

1993 Annual Report

The 1993 Annual Report of the Missouri Botanical Garden is available on request. To obtain a copy, please call (314) 577-5120 or write the Development Office, Missouri Botanical Garden, P. O. Box 299, St. Louis, Missouri 63166-0299. You may also pick up a copy in the lobby of the Administration Building at 2345 Tower Grove Avenue, or the Public Relations Office in the Ridgway Center, Monday through Friday, 8:30 a.m. to 5 p.m.

"Birds" Fountain

WALDEMER MEMORIAL FOUNTAIN — "Birds," a bronze sculpture by Robert Lee Walker, is a delightful accent to the landscape near the Lehmann Rose Garden. Summertime visitors appreciate the bird-shaped bubbler drinking fountains set into the base of Tennessee marble, which make the fountain a cool shady oasis on a hot day. A ginkgo tree at the site influenced the composition of bird forms in flight. Installed in 1976, the fountain was a gift of Mr. and Mrs. Edwin R. Waldemer.

CLIFF WILLIS

Honorees at the luncheon, first row from left: Alyce Hildebrandt, Mickey Schreiner, Virginia Eschrich, Dorothy Evers, Gene Jarvis, Clara Moult, and Sue Wilkerson, director of human resource management. Back row, from left: Janet Dickey, Peter Raven, Paul McClinton, Si Dietz, Ed Gildehaus. Not pictured: Nell Menke, Gloria Schopp, Dolly Darigo, Art Eschrich, Celest Fleming, June Holtzmann, Virginia Hrevus, Jeanette Neuner, Evelyn Schachner, Carolyn Ullensvang.

Volunteer Service Recognition

THE GARDEN honored some of the men and women whose gift of service makes the Garden what it is at a luncheon in Spink Pavilion on April 20, 1994. Dr. Raven paid tribute to all of the Garden's hundreds of volunteers, citing the world's environmental crisis as a "clear call to action....Volunteers are at the heart of change and you are wonderfully representative of that heart. Your sense of obligation and personal attachment have made you advocates of unparalleled importance for the Garden."

Honored for 20 years of service were Si Dietz and Ed Gildehaus, Horticultural Answer Service; Gene Jarvis, Climatron; Nell Menke, Arboretum; Clara Moult, Garden Gate Shop; and Gloria Schopp, Tower Grove House.

Recognized for ten years of service were Dolly Darigo, Janet Dickey, Art Eschrich, Virginia Eschrich, Dorothy Evers, Celest Fleming, Alyce Hildebrandt, June Holtzmann, Virginia Hrevus, Paul McClinton, Jeanette Neuner, Evelyn Schachner, Mickey Schreiner, and Carolyn Ullensvang.

GARDEN GATE SHOP

Garden Publishes Book on Rain Forests

Exploring the Tropics

by Glenn E. Kopp, Barbara Addelson, Helena Williams Fox, John MacDougal, and Sandra Rode
Missouri Botanical Garden
Illustrated, 24 pages. $4.00

THE STAFF of the Garden has teamed up to turn its successful series of brochures, "Exploring the Tropics," into an attractive new book available in the Garden Gate Shop. The book is a beautifully illustrated introduction to the facts and issues concerning the world's tropical forests. Chapters such as "Tropical Rain Forest Layers" and "Plant/Animal Interactions" give a clear overview of a complex subject for readers of all ages. Single copies are available from the Shop, and bulk orders are available at a discount from the Garden's Education Division, (314) 577-5140.

CLIFF WILLIS

Behind the Scenes

Patty Arnold Joins Development Staff

A FAMILIAR FACE is back in the Development Division. In May, Patty Arnold joined the staff as prospect research coordinator for the Partnership Campaign. Patty is well known to Garden members and staff; she served as the Garden's coordinator of membership services in 1981-84 and as coordinator for the Proposition E campaign last fall. Patty has been on the Members' Board since 1988 and in 1992 she served as its second vice president.

Patty is a native St. Louisan. She graduated with a B.S. from University of Missouri-Columbia, and lives in Kirkwood with her husband Todd and their three sons. "It is a delight to be working for the Garden full time again," she said. "The Partnership Campaign is a great challenge, and I look forward to helping the Garden meet its goals for the future."

Volunteers Needed!

A NUMBER of interesting volunteer positions as well as special event volunteer assignments are available at the Garden. Opportunities currently open are in Horticulture, Education, Research, and the Plant Shop. A variety of skills, knowledge, and interests are welcomed, including clerical/data entry, library, horticulture, sales, and more. Training will be provided. Please call the Volunteer Office of Human Resource Management at 577-5187 to apply.

CLIFF WILLIS

THE HENRY SHAW COMMITTEE

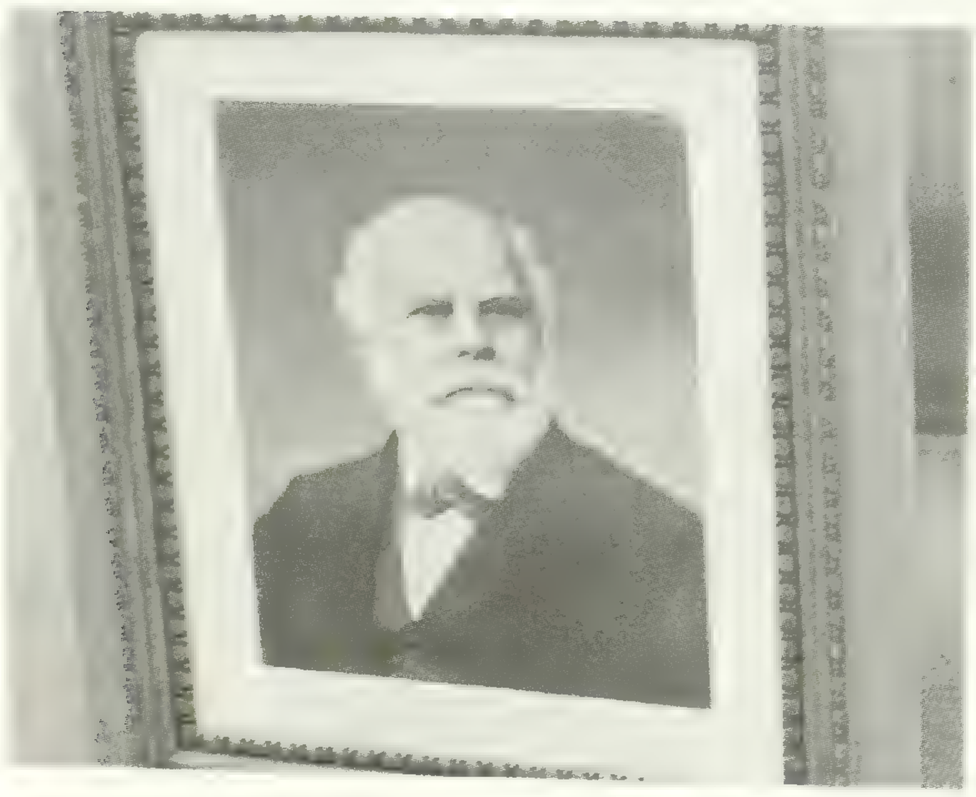
Keeping the Garden Blooming

MEMBERSHIPS, tax support, admissions, and grants provide a large portion of the funds for the Garden's day-to-day operations, and the Henry Shaw Committee helps keep the Garden functioning at its current level. This group of dedicated members works behind the scenes to solicit gifts from individuals and corporations in addition to their regular levels of support and to locate and encourage new donors.

Marcia Kerz, director of development, said, "The Committee's personal approach provides important sources of funds that help to maintain the Garden's high level of services and displays. We are deeply grateful for their hard work and support."

Above: At a recent meeting of the Board of Trustees, the Henry Shaw Committee was honored. Shown standing, from left: Pat Ackerman, Chuck Freeman, Mim Kittner, John Wallace. Seated, from left: Nora Stern, Doug MacCarthy, Walter Stern. Not pictured: Walter Ballinger, Becky Fouke, Carolyn Hager, Judy Lamy, Nancy Reed, Kay Wren, Hal Wuertenbaecher.

CLIFF WILLIS



Library Receives Engelmann Photograph

THE ARNOLD ARBORETUM of Harvard University has given an original 16" x 20" framed photograph of George Engelmann on permanent loan to the Missouri Botanical Garden. Engelmann, a German-born St. Louis physician with training in botany, was Henry Shaw's scientific advisor and was instrumental in convincing Shaw to plan for a complete botanical garden — one that includes research and education along with horticultural displays. In 1857, while Engelmann was traveling in Europe, he purchased books and herbarium specimens that became the basis for the Garden research program.

RENOVATING A HISTORIC BUILDING AT THE GARDEN

Museum Ceiling Gets a Face Lift

THE MUSEUM BUILDING at the Garden was built by Henry Shaw at a cost of $25,000 in 1859. Today the building, which is usually not open to the public, houses the Ewan Collection, a major archive of literature on the history of natural science.

The Museum Building, modelled on the Old Museum at Kew Gardens, was designed by George I. Barnett, who also designed Tower Grove House. The Museum has a beautiful vaulted plaster ceiling with paintings attributed to Leon Pomerede. A contemporary account said, "...probably no such depiction of the world's fauna and flora has ever been brought together in such a small space."

Last winter the Garden faced the distressing possibility that the ceiling might have to be taken down. Although the building has been carefully maintained, the old plaster was falling away in places, posing a hazard, and estimates to restore it were beyond the Garden's means. Fortunately architect Phil Cotton, who had recently supervised repointing brickwork on the Linnean House, had a solution. Cotton recommended the St. Louis firm of Picco and Benson, who worked on the ceiling restoration of the Shrine of St. Joseph.

"John Picco and his people used 360 plaster anchors screwed into the ceiling joists," Cotton said. "The anchors are invisible from floor level and hold the plaster securely. They went over every inch of the ceiling, tapping the plaster to find every loose spot. We also discovered that about a third of the ceiling had been repainted at various times, sometimes crudely; the workmen restored the poorly painted sections beautifully."

Improved lighting was also installed in the Museum. Not only is the ceiling preserved for the future, the total cost of the project was much less expensive than other options.

CLIFF WILLIS

On the scaffolding during the restoration of the Museum ceiling are (from left): John Picco, with painters John Walsh and Buford Heberer.

New Mentoring Program

Garden Staff Works With Students

DURING the 1993-94 school year, eleven students from Mason Investigative Learning Center visited the Garden every month to meet with staff "mentors." Mentoring gives students the opportunity to see what the workplace is about and to gain skills and confidence to be responsible for their own futures.

Each student from the middle school met regularly with a Garden staff member whose responsibilities matched the students' career interests. Staff participants were chosen from horticulture, education, research, development, and general services. The students "shadowed" their mentors, getting the opportunity to observe behind the scenes and ask lots of questions.

Cory Collins, Mason School's top science project winner and Queeny Park Science Fair Divisional Winner, said, "I met new and interesting people and saw how every job can be related to one another. They had fascinating jobs like illustration, electrical engineers, moss experts, and many more. I got to see things the public is not able to see, and got an all-around education about the plants in the Garden. My mentor was great because she has a great personality, an interesting job, and I enjoyed talking with her. This is a great program and I think it will inspire many in choosing future careers."

CLIFF WILLIS

Mentors and their students had a picnic in Tower Grove Park to celebrate the close of the school year. Front row, from left: Amy Haake, Devin Strong, Kiet Tran, Tiffany Caldwell, Susan Caine, Ronetta Williams, Ben Chu, Barbara Addelson, Anne Keats Smith. Back row: Chris King, Tiffani Edwards, Jerry Chambers, Jamie Robinson, Brett Brooks, Cory Collins, Katie Belisle, Yevonn Wilson-Ramsey, Rafael Whitter, Judy Bramble, Erica Lucius, Tina Pey.

Paul Brockmann Honored

THE International Facility Management Association recently awarded the designation of Certified Facility Manager to Paul Brockmann, director of general services at the Garden. This distinction signifies the fulfillment of stringent educational and work experience requirements, in addition to career achievements that demonstrate competence.

Brockmann has managaged the Division of General Services at the Garden since 1976. His responsibilities include all maintenance, construction, housekeeping, and security operations. Dr. Peter H. Raven, director, said, "We are very proud of what Paul does for the Garden and enjoy working with him. He is an outstanding individual, and I am really glad that he has received this recognition."

NEWS FROM THE CENTER FOR PLANT CONSERVATION

MacArthur Foundation Supports Hawaii Program

The John D. and Catherine T. MacArthur Foundation has awarded $280,000 to the Center for Plant Conservation (CPC) in support of its Hawaii Conservation Program. As of 1993, the federal government had listed 63 Hawaiian plants as endangered, with another 200 plants or more to be listed in the future. In 1989, the CPC designated Hawaii as one of five U.S. areas of highest plant endangerment, with approximately 15 to 30 percent of all native endangered U.S. plants found in the islands.

"The MacArthur Foundation takes great pride in its ability to fund such a worthwhile and necessary endeavor as the Hawaii Conservation Program" said Dr. Dan M. Martin, director of World Environment and Resource Programs for The MacArthur Foundation.

The CPC, headquartered in St. Louis at the Missouri Botanical Garden, is the only national organization dedicated exclusively to the study and preservation of America's rarest plants and to educating the pubic about them. The CPC maintains a living collection of more than 450 of America's most endangered plants within a network of 25 botanical gardens and arboreta across the country.

Funds provided by the MacArthur Foundation will aid the CPC Hawaii program office located at the Bishop Museum in Honolulu and support the conservation, educational and research activities of the Center's five participating gardens in Hawaii: The Amy B. H. Greenwell Ethonobotanical Garden in Captain Cook, Hawaii Island; Harold L. Lyon Arboretum in Honolulu; Honolulu Botanical Gardens, headquartered in Honolulu; National Tropical Botanical Garden in Lawai, Kauai; and Waimea Arboretum and Botanical Garden in Haleiwa, Oahu.

"The conservation crisis in Hawaii cannot be overstated," said Dr. Brien A. Meilleur, president of CPC. "The CPC is very grateful to The MacArthur Foundation for its generous support."

CLIFF WILLIS

Julie Gerth, a former ECO-ACT student at the Garden (left), and LREC site manager William Davit help Julie's second grade students plant wildflowers to restore a woodland plot.

Field Science Grants Aid Woodland Restoration

JULIE GERTH had always been interested in science and the natural world when she was growing up, but she did not consider teaching as a career until she participated in the Garden's ECO-ACT Program as a high school senior. ECO-ACT is an environmental leadership program for high school students that focuses on ecology and environmental science while helping students to develop their leadership skills. In turn, the students teach younger children about ecological concepts.

Today Julie is a second grade teacher at Our Lady of Lourdes School. In 1993 she received a Field Science Grant to lead her second grade students in a woodland restoration project at the Litzsinger Road Ecology Center (LREC), a 34-acre outdoor education center in St. Louis County managed by the Garden. The LREC features a log cabin classroom, a stream, woodland, and restored prairie habitats.

Last November Julie and her students identified and removed an invasive, exotic species of *Euonymous* which had spread over large areas of the LREC woodland, crowding out native species. Over the winter, the children learned to weave baskets with the *Euonymous* vines; last spring, they sprouted native woodland wildflowers in their classroom and then transplanted them into the cleared forest plots. The exercise teaches the students about plant diversity and "shows them that we're not taking something away, but actually restoring the area," Julie explained.

Julie finds the LREC ideal for conducting natural awareness activities. Her students have learned about fossils on the stream banks and studied fresh animal tracks after a rain. Because of the LREC's convenient location in the St. Louis area, classes can visit the Center often and experience seasonal changes in nature. Julie is enthusiastic about plans for future activies at the LREC, including planting tree seedlings along the stream to teach her students about erosion control, and using the stream to demonstrate water quality testing techniques. She said, "I want to instill in the students a deep love of nature, so deep that they will want to save it. I want them to understand that every decision they make will have an impact on nature and the world."

The LREC sponsors the Field Science Grant Program to provide financial support for teachers and students who wish to use its facilities. The funds help to provide transportation to the Center, release time from school, and materials; the LREC staff helps participants to design and implement their own natural science projects. Dr. Judith Bramble, coordinator of teacher training for the Garden, explained that "the grants program allows students to participate directly in research activities, and helps teachers acquire the skills to teach natural science anywhere."

For more information on the LREC Field Science Grants Program, please call the Education Division at 577-5140.

Raven Honored by Field Museum

Peter Raven holds a crystal globe, part of the Centennial Award of Merit presented to him by Doug Walter (right), co-chair of the Founders' Council of the Field Museum.

THE FIELD MUSEUM IN CHICAGO honored the Garden's director Peter H. Raven with its Founders' Council Centennial Award of Merit, presented at a dinner at the Museum on Saturday, May 21, 1994. The Award of Merit is given annually to pay tribute to individuals who have made significant contributions toward bringing aspects of evolutionary and environmental biology to the forefront of public attention. Previous recipients include Stephen Jay Gould, Roger Tory Peterson, Sir David Attenborough, Edward O. Wilson, Daniel H. Janzen, and Michael Crighton. Dr. Angel C. Alcala, Secretary of the Department of Environment and Natural Resources in the Philippines, was also awarded the Centennial Award of Merit but was unable to attend.

The Award was presented in conjunction with the Field Museum's commemoration of its centennial, a ten-month celebration that culminated in June, 1994. During his visit, Dr. Raven participated in a public conference hosted by the Museum's Center for Evolutionary and Environmental Biology titled "Dimensions of Biodiversity: Global, Natonal and Local Perspectives." The two-day seminar featured scientists, public policy makers, and conservation professionals from around the world meeting with educators and students from the Chicago area. Dr. Raven spoke on "Assessing Global and Local Biological Diversity."

In Memoriam
Hazel L. Knapp

The Garden lost one of its dearest friends with the death of Hazel Knapp on April 13, 1994. Mrs. Knapp, a founder of the Friends of the Missouri Botanical Garden, was 101.

Mrs. Knapp, a native St. Louisan, was a pioneer of organic gardening, a noted lecturer who was famous for the beauty of her gardens. She was active in community and garden club affairs throughout the St. Louis area.

Dr. Peter H. Raven spoke at a tribute to Mrs. Knapp held at Spink Pavilion on April 19. He said, "Hazel's passion for gardening was widely known and acclaimed....In 1939, she was instrumental in the formation of the Friends of the Garden, the membership organization which today numbers a remarkable 30,000! A grove of rhododendron was planted at the Garden in 1975 in honor of her many years of service.

"As an early advocate of not using chemicals to control pests, Hazel's philosophy is reflected in the Garden's integrated pest management program. Her idea of using plants that are well adapted to the region helps guide the Garden today. Her correspondence, scrap books, and photographs are a treasure in the archives and will help us to understand the development of the Garden over a 50-year period. Hazel lived a wonderfully full and diverse life, and all of us at the Garden are privileged that we knew her and shared her friendship."

Mrs. Knapp's granddaughters, Stephanie Knapp Littlefield and Cynthia Knapp Fry, have dedicated a generous gift to place Mrs. Knapp's name on one of the features of the new Entry Court at the Kemper Center for Home Gardening. They have requested that any tributes in memory of Mrs. Knapp also be used for the Entry Court, which is being supported by a special fundraising project of the Members' Board. Dr. Raven said, "Given Hazel's deep love of gardening and intimate affiliation with the Garden's membership program, this is a very fitting and appropriate commemoration to her and we are thrilled to recognize her in this very meaningful and significant way."

Garden Leads Peru Adventure for High School Students

While many high school students spend their spring break lying on the beach in the Florida sun or sleeping late at home, a group of 12 students from St. Louis went on the trip of a lifetime to the Peruvian Amazon. The trip was lead by Dr. Larry DeBuhr, the Garden's director of education, and Maried Swapp, an instructor in the Education Division.

The students, from Mary Institute and Country Day School, St. Louis Priory, and St. Joseph's Academy, were accompanied by four teachers. Everyone in the group participated in the International Rain Forest Workshop, an 8-day adventure exploring the ecology of the Amazonian lowland flooded forests.

Native Yagua Indians demonstrated how to make blow guns for hunting, weave baskets for carrying materials through the forest, prepare shelter from palm leaves, and fish with special nets. Participants tasted biscuits made from manioc roots and juice from the camu camu fruit, which contains more vitamin C than any other plant. Some of the participants learned how to paddle a dugout canoe and to make a clay pot from local soil.

Many in the group hiked into one of the richest areas of rain forest on Earth. Nearby the Explorama Lodge, the home base for the workshop, is a one-hectare (2-1/2 acres) site where the late MBG botanist Alwyn Gentry found over 300 species of woody plants, more than any other place in the world. The group was also able to take early morning bird-watching boat rides into black water lakes where they observed hundreds of bird species, three-toed sloths, and the famous giant *Victoria* water lily.

At the ACEER (Amazon Center for Environmental Education and Research) Camp, the students and their adult companions walked upon a suspended system of aerial platforms and pathways that take visitors 118 feet up into the canopy of the forest itself. From this canopy walkway, observers see orchids, bromeliads, and hundreds of other epiphytes as well as birds, lizards, insects, and other animals in their own habitat far from the forest floor.

In one extraordinary week, the students learned a better understanding of the incredibly rich diversity of the rain forest, and how important the plants growing along the Amazon River are to the people who live there and the people of the world.

— Larry E. DeBuhr, Ph.D.

CLIFF WILLIS

Visitors from Nanjing — In April the Garden hosted a group from Nanjing, China, a St. Louis sister city. The group was touring several cities in the U.S. The Garden is currently working with Nanjing to construct a traditional Chinese pavilion, part of the Garden's new Chinese display garden. Shown, from left: Zeng Jianhua, deputy director of Nanjing Foreign Economic Relations and Trade Commission; Joel Glassman, president of Nanjing-St. Louis Sister City Committee; Jing Yuan Hu, deputy director of Nanjing Foreign Affairs Office; Peter Raven; Gu Hao, party secretary of CPC Nanjing Committee and honorary chairman of Nanjing People's Association for Friendship with Foreign Countries; Chen Weijian, deputy director of the General Office of Nanjing Municipality; Zhu Yuzhu, interpreter with the Nanjing Foreign Affairs Office; and Sun Jiaxing, secretary to Mr. Gu Hao.

TRIBUTES
MAR • APR 1994

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Mr. and Mrs. Lester Adelson
Mr. and Mrs. Jack E. Edlin
Dr. and Mrs. Benjamin Milder
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GenCorp Automotive Plant
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Mr. and Mrs. Philip Pfeffer
Mr. and Mrs. Arthur F. Boettcher Jr.
Jean Richardson
Ellen and Henry Dubinsky
The tribute above was listed incorrectly in the last Bulletin. *We regret the error.*
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Mr. Gideon Schiller
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Geraldine and Gideon Schiller
Mr. and Mrs. Stanley Wielansky
Mr. and Mrs. Blanton Whitmire
Cathy Whitmire
Granddaughter of Mr. and Mrs. Norman Wielansky
Mr. and Mrs. Melroy B. Hutnick

IN MEMORY OF

Mother of Ed Adams
Jean Hudson
Pat Payton
Mr. Fred C. Ahrens
Mr. and Mrs. Charles W. Oertli
Dr. Edgar Anderson
The Boxwood Society of the Midwest
Miss Laura Andreas
Ms. Helen Brown
Ms. Corrinne Hallquist
Mrs. Isaac C. Orr
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Inside This Issue

3.

GROUNDBREAKING FOR NEW DEMONSTRATION GARDENS

Phase 2 of the William T. Kemper Center for Home Gardening is underway.

4.

ARBORETUM EXHIBITS PLANNED

The Arboretum moves forward with renovations to the 1879 Manor House.

6.

NEW BOXWOOD GARDEN

Plans are announced for the Ruth Palmer Blanke Boxwood Garden.

8.

PARTNERSHIP CAMPAIGN UPDATE

Million dollar donors take the capital campaign past the halfway mark.

10.

HOME GARDENING

Honeybees are the newest guests at the Kemper Center.

12.

CALENDAR OF EVENTS

"Kids in Bloom" in July, and fun for all.

14.

NEWS OF THE MEMBERS

A trip to Chile for members, plus an update on the "Yellow Brick Road."

16.

HENRY SHAW COMMITTEE

A dedicated group works behind the scenes to keep the Garden blooming.

20.

TRIBUTES

Family and friends are honored with a gift to the Garden.

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20th Annual

Japanese Festival

Labor Day Weekend

Saturday, September 3 – Monday, September 5, 1994

10 a.m. to 10 p.m. daily

Celebrate the culture of Japan at one of the largest and oldest festivals of its kind in the United States. Enjoy authentic Japanese art, food, music, dance, and the beauty of *Seiwa-En*, the Japanese Garden.

San Francisco Taiko Drummers

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Bonsai Display

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Japanese Classical Dance

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And More!

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SPECIAL WEEKEND EVENT

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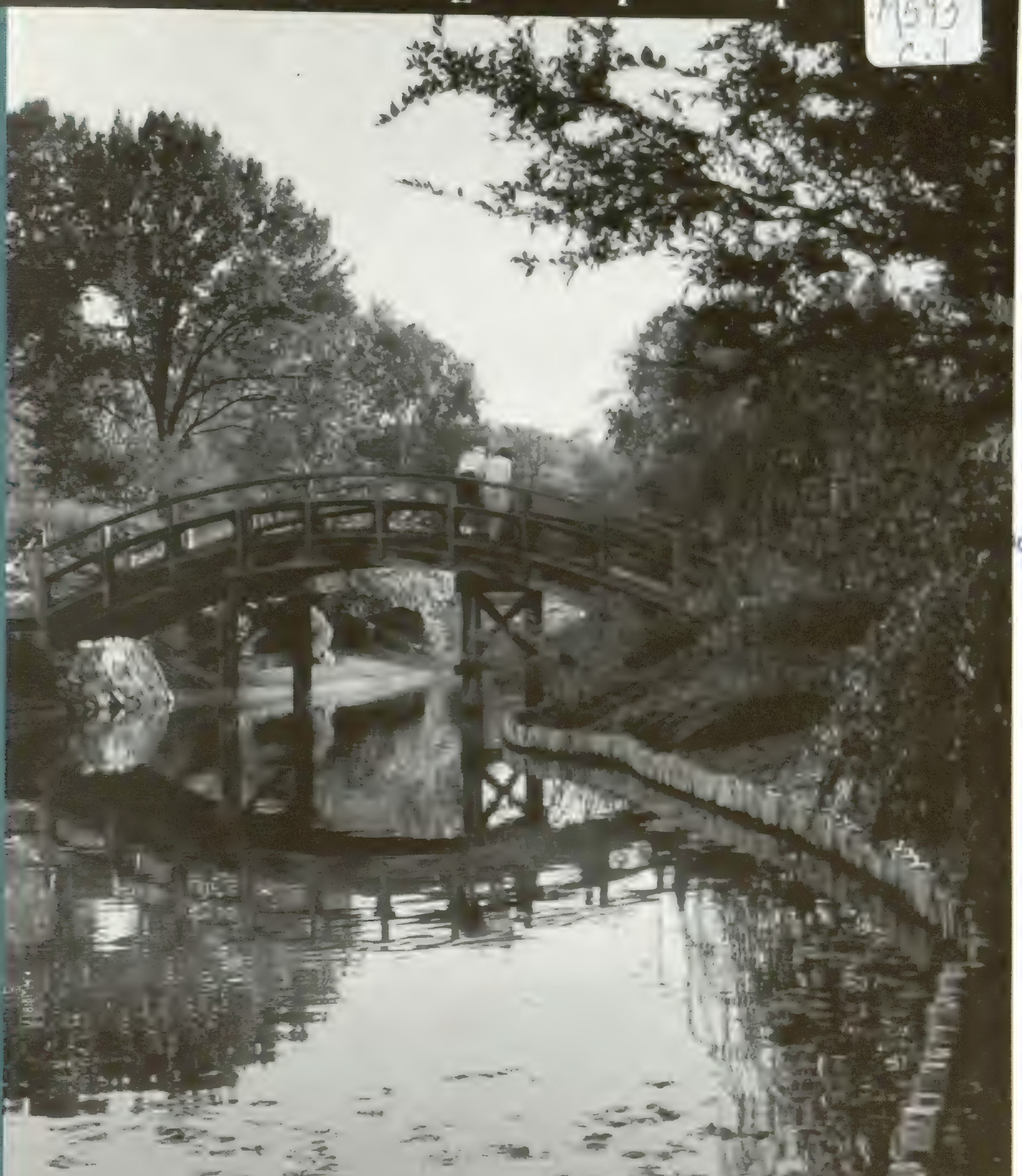

Missouri Botanical Garden

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Comment

MISSOURI BOTANICAL GARDEN MISSION: "TO DISCOVER AND SHARE KNOWLEDGE ABOUT PLANTS AND THEIR ENVIRONMENT, IN ORDER TO PRESERVE AND ENRICH LIFE."

Just as this issue of the *Bulletin* goes to press, we received copies of the first published volume of the *Flora of China*. This landmark event, the first fruits of years of hard work by botanists here and in China, is a splendid accomplishment, and I hope you will enjoy reading all about it in the November/December issue.

Labor Day ushers in a rush of activities everywhere, and the Garden is no exception. The 20th annual Japanese Festival highlights Labor Day weekend, with new things to see and do plus old favorites including the thrilling Taiko Drummers. October brings the third annual "Best of Missouri" Market, the enormously popular festival celebrating the growers, musicians, and artisans of our state. And October finishes up with a flourish as the Fall Flower Show welcomes another season of beautiful floral displays.

On page 5 we offer the first look at the architects' vision for our new research building, scheduled to break ground next year. "You and the Environment" is especially pertinent for the back-to-school season, with a comprehensive summary of the best books on environmental issues for children and adults, all available through the Garden Gate Shop. On pages 6 and 7 we introduce the Heritage Society, a very special concept in donor support and services, and on page 11 you can get your first glimpse of an exciting gift idea for the holidays, a new line of specialty foods with botanical flair, straight from the kitchens of the Garden's caterers, Ces & Judy. This year for the first time, the charming Garden Holiday Card will be available by mail order — watch your mailbox, and see page 19 for a preview.

As you may have noticed, so much is happening at the Garden, we can't cover it all in just 24 pages! This issue of the *Bulletin* is our first with 28 pages, but it won't be the last. We hope you enjoy this expanded issue, just one of the many benefits of your Garden membership.

Please take advantage of the beautiful autumn weather to visit the Garden often and enjoy all of the fall color and activities.

— Peter H. Raven, Director

CLIFF WILLIS

CACTUS SOCIETY ASSISTS WITH DESERT HOUSE PLANTS — Josephine Goelzhauser (left) and Pat Thomann, president of the Henry Shaw Cactus Society, examine plants in the C-3 greenhouse devoted to maintaining the Garden's collection of desert plants. The Society, celebrating its 49th year, is helping the Horticulture Division to find homes for the plants from the Desert House, which has been closed until a new facility can be built. The project involves checking the computer inventory, assessing the value of rare plants, and selling duplicates to make room in the greenhouse for the specimens from the Desert House. The Garden's collection of cacti and succulents, some of which date from the 1940s, includes over 75 endangered species. The Henry Shaw Cactus Society has more than 75 active members who support the Garden with their donations, profits from plant sales, and expert assistance with the plants.

On page 9 of the July/August Bulletin, *Alison Arnold of the North Carolina Arboretum was identified incorrectly. We regret the error. — Editor*

Moving?
Please remember to send us your new address.

To avoid missing any of your membership mailings, we need notification of your new address at least three weeks before you move. Please enclose the mailing label on the back cover of this *Bulletin* and mail to:

Name:_____
Old Address:
Street_____
City_____
State_____ Zip_____
New Address:
Date effective:_____
Street_____
City_____
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On the Cover

Seiwa-En, "garden of pure, clear harmony and peace."

Photo by King Schoenfeld

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Invited guests are presented to the Emperor and Empress at the Japanese Garden. Shown meeting the Emperor is Mrs. Robert Tschudy, president of the Executive Board of the Members, and her husband; at right are Mr. and Mrs. John K. Wallace, Jr. Mr. Wallace is president of the Board of Trustees.

THE GARDEN WAS HONORED to welcome Their Majesties, the Emperor and Empress of Japan, to an exclusive private tour on Saturday, July 18, 1994. Emperor Akihito and Empress Michiko were the first members of the Japanese Imperial family ever to visit St. Louis, and they specifically requested a visit to the Garden and its renowned *Seiwa-En*, the largest authentic Japanese Garden outside Japan. The tour was part of a two-day stay in St. Louis that included a visit to the Gateway Arch, a reception at the St. Louis Art Museum, a Cardinals baseball game at Busch Stadium, and a luncheon at the History Museum.

The Imperial entourage arrived at the Garden, which had been closed to the public for the visit, at 10:15 a.m. They were escorted on a tour of the John S. Lehmann Building, where they viewed research exhibits, rare books, and Japanese botanical specimens from the library and herbarium.

The Imperial party traveled by tram to the stone boat basin overlooking *Seiwa-En*, "garden of pure, clear harmony and peace," where the royal couple planted a young Japanese maple, *Acer palmatum* 'Tsuma gaki,' to commemorate their visit. The Emperor and Empress were introduced to some of the 450 invited guests at the tree planting ceremony, including representatives of several Japanese-American organizations and the staff and volunteers who maintain *Seiwa-En*. Afterward the Emperor and Empress moved into the crowd, shaking hands and greeting delighted guests.

Next, the Imperial party visited the Climatron and the Shoenberg Temperate House, where the staff showed them plants from several endangered species maintained as part of the national collection of the Center for Plant Conservation, which is headquartered at the Garden. The Emperor and Empress waved to about 1200 guests, Garden members, and volunteers, who had waited all morning to greet the royal couple.

The tram carried the Imperial party past the Spink pavilion, where they paused to congratulate a wedding party gathered on the terrace. They departed the Garden at 11:45 a.m.

After the visit, Dr. Raven said, "The Emperor and Empress were absolutely delightful and truly seemed to enjoy themselves. They were very complimentary about the beauty of the Garden and were very interested in the displays of herbarium specimens and endangered plants. All of the Garden's members, staff, and friends are very proud and happy to have been able to welcome the Imperial visitors here today."

AN IMPERIAL VISIT

Emperor and Empress of Japan at the Garden

MISSOURI BOTANICAL
SEP 19 1994
GARDEN LIBRARY

CLIFF WILLIS

Above: Empress Michiko, Emperor Akihito, and Peter H. Raven at the tree planting ceremony. Left: The Imperial couple greet guests and well-wishers.

New Gardens at the Kemper Center

The Backyard Garden

CORNELIA SUNNEN was a lifetime member of the Garden who devoted time and energy to it as a volunteer and a contributor throughout her lifetime. Recalling her avid interest in gardening, Mrs. Sunnen's daughters, Helen Sly and Esther Kreider, decided to donate the Backyard Garden at the Kemper Center for Home Gardening in their mother's memory through a gift from the Sunnen Foundation.

The Sunnen Foundation was founded by Cornelia's husband, Joseph Sunnen. Their work was continued by their son, the late Robert M. Sunnen, who served as chairman and chief executive officer at Sunnen Products Company and as president of the Sunnen Foundation. He also served on the Botanical Garden Subdistrict of the Metropolitan Zoo/ Museum District from 1983 until 1990. Currently, Helen Sly and Esther Kreider are directors on the board of Sunnen Foundation, with Helen Sly serving as president.

Garden director Peter H. Raven said, "The Sunnen Foundation and Corporation have been an integral part of our growth and development for many years. Naming this wonderful Kemper Center Garden in Mrs. Sunnen's memory is certainly a wonderful way to remember her many years of friendship, as well as that of the rest of the family." Raven noted that support from the Sunnen Foundation over the years has included assistance with a variety of projects in the Garden's library and herbarium, including funding for herbarium mounters, a grant to update systems for storage of manuscripts and other archival materials, and, most recently, a generous contribution to fund the library's recataloging.

The Backyard Garden is entered from the middle level of the Kemper Center on the north side. The garden will provide a wealth of ideas and demonstrations on how to transform a typical backyard into an outdoor "room", extending the living space. The garden will feature groundcovers and lawns; shrubs and ornamental trees at backyard scale and selected for four seasons of interest; container gardening; lighting, furniture, and paving; and residential landscape irrigation systems.

The Backyard Garden features a terrace overlooking a splashing fountain and pool with cast bronze sculptures of four playful otters chasing a group of leaping fish, making a delightful resting spot on a trip through the Kemper Center. Mrs. Kreider said, "We are happy to be a part of the Garden's growth and so pleased that we can make a contribution that so well reflects a major love of our mother's life."

A Trip to China

St. Louis Gift To Be Dedicated in Nanjing

THIS FALL, St. Louis and Nanjing, China, will celebrate their fifteenth anniversary as sister cities and the historic occasion when they created the first U.S.-China sister city link. In honor of the occasion, the city of Nanjing will dedicate a gift from St. Louis, an American-style playground for children of all ages. Mayor Freeman R. Bosley, Jr., will lead a group of St. Louisans to China on a trip that will include the event in Nanjing as its first stop. Mayor Wang Wulong and a host of Nanjing dignitaries will host the group from St. Louis at the anniversary celebration.

The highlight of the visit will be the dedication of the playground, designed by Robert E. Goetz, an award winning landscape architect who has designed master plans for more than 140 parks throughout the Midwest. Nanjing's anniversary gift to St. Louis is a traditional pavilion that will be the centerpiece of the new Chinese Garden currently under construction at the Missouri Botanical Garden.

Sister City Anniversary Tour

October 21 to 28, 1994

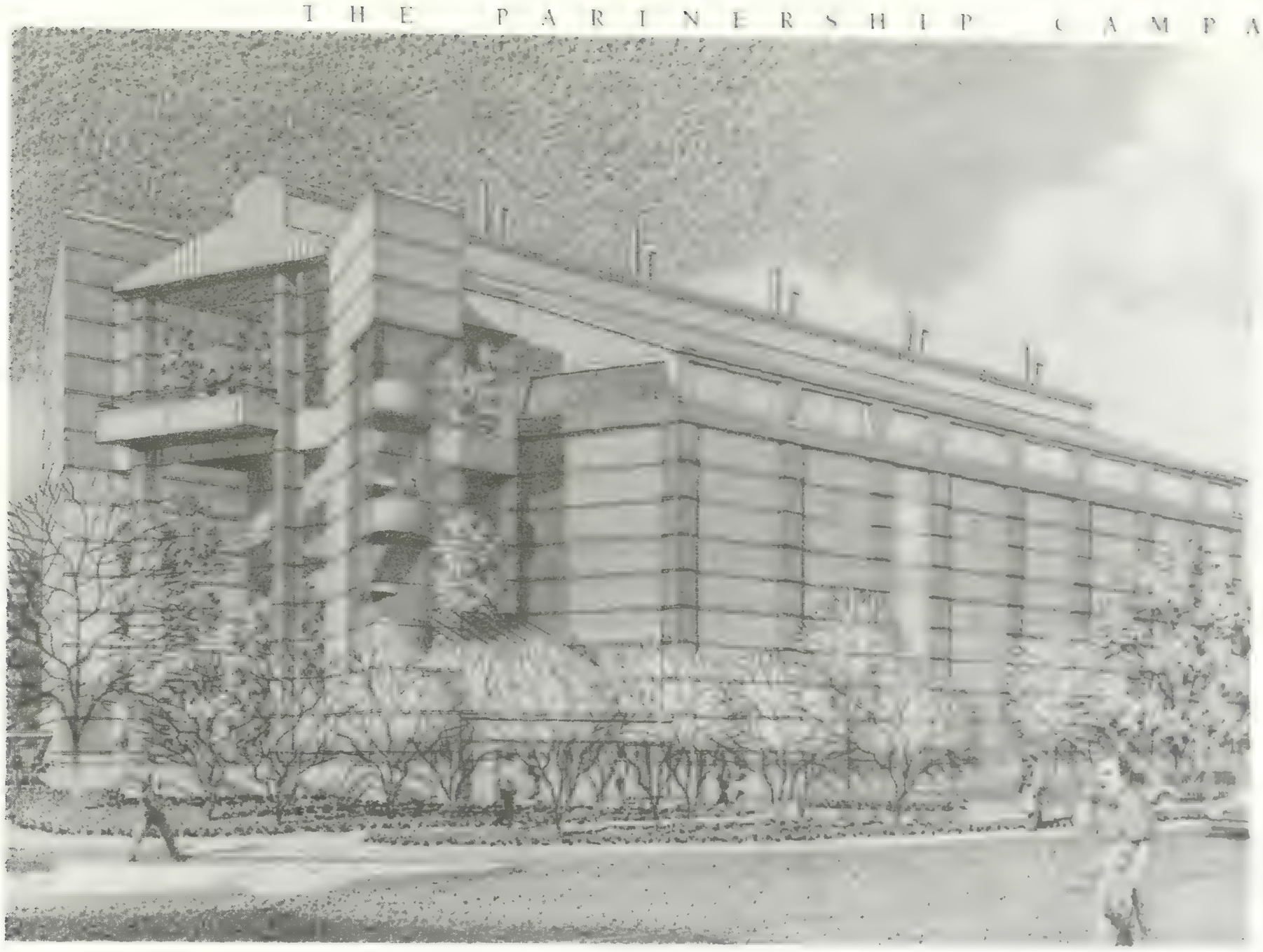
The Nanjing-St. Louis Sister City Committee has organized the eight day Anniversary Tour, which includes visits to Nanjing, Shanghai, and Beijing, at a cost of $2,295 including land and air travel from St. Louis. Optional trip extensions offer a thirteen-day tour that includes the cities of Xian and Guilin for $2,960, and a fourteen-day tour for $3,388 that adds Wuhan, Chongquing, Hangzhou, and a Yangtze River cruise to the itinerary. Just as St. Louis is known as the Gateway to the West, Nanjing is the gateway to northern and southern China, which are linked by the Yangtze River Bridge at Nanjing. The 5,000-year-old city is set in beautiful surroundings along the banks of the Yangtze, China's longest and most important waterway, at the foothills of the Purple and Gold Mountains.

One of China's great cities, Nanjing was the capital of the Ming and seven other dynasties. Today it is the capital of Jiangsu, one of China's wealthiest and fastest growing provinces. With a metropolitan area of over five million people, the city is a major cultural, industrial, and transportation center for China.

Joining Mayor Bosley in leading the trips will be Dr. Joel Glassman, president, and Dr. Ching-ling Tai, vice president, of the Nanjing Sister City Committee. Glassman is director of the Center for International Studies at the University of Missouri-St. Louis and an expert on China. Dr. Tai, a native of Shanghai, teaches Chinese language at St. Louis University High School. For information about the Anniversary Tour, call (314) 553-5755.

Far East Trade Mission and Economic Delegation

In conjunction with the Anniversary Tour, the World Trade Center of St. Louis has organized A Far East Trade Mission and Economic Delegation designed for business people who wish to explore investment and trade opportunities in Taiwan, Hong Kong, and China. The Trade Mission will join the Anniversary Tour in Nanjing. For information call (314) 862-0201.



An architect's view of the new research facility at the southwest corner of Shaw and Vandeventer

OPPORTUNITIES FOR NAMING GIFTS

New Research Building Will Enhance St. Louis

THE PARTNERSHIP CAMPAIGN enters a new phase this fall. The current capital campaign, launched publicly last fall, has already received $17.7 million in gifts and pledges toward its $30.9 million goal. The Garden's new research facility, to be built on the southwest corner of Shaw and Vandeventer at a projected cost of $17.4 million, is the largest single component of the campaign.

The new building will embody the Garden's mission in several key ways. Earlier issues of the *Bulletin* have dealt in detail with the global importance of the Garden's research program, its urgent need for additional space, and its scientific leadership nationally and internationally. We have also illustrated how the facility will serve as a model for new construction concerned with environmental issues. Now, with our first glimpse of what is to become a major architectural landmark in St. Louis, it is appropriate to consider an additional aspect of the new research building -- its revitalizing role in its neighborhood and in the city.

The new building will replace the Polar Wave Ice & Fuel building, a gas station, and a collection of industrial properties at the corner of Vandeventer and Shaw. As designed by a team of architects, the Christner Partnership and Louis R. Saur and Associates, both of St. Louis, in consultation with the Croxton Collaborative of New York, the new building will be a beautiful addition to the neighborhood of homes, schools, and businesses that surround the Garden. The handsome four-story facade of brick and glass, surrounded by green landscaping, will harmonize with and enhance the surrounding streets and provide a visual link to the Garden for visitors arriving from Kingshighway and Interstate 44. The proposed additional ramps from I-44 at Vandeventer will improve access to the Garden and neighborhood businesses.

Recent articles in the *South City Journal* and *Southwest City Journal* emphasized the support of the neighbors for the new building. Anna Croslin, president of the Shaw Neighborhood Improvement Association, was quoted:"We certainly think that it would be a great improvement for that section of neighborhood; we support it."

In addition to neighborhood support, city officials see the Garden's new research facility as the southwestern anchor of a core of biotechnological businesses proposed for mid-town St. Louis. Patrick Bannister, director of business development for the St. Louis Development Corp., has said, "It [the new facility] certainly enforces the idea that the area...has a great deal of potential for attracting research companies.... These anchors provide the stimulus." The "anchors" are the Washington University Medical Center, St. Louis University Medical Center, and the Garden. The city hopes to attract pharmaceutical companies, research firms, testing laboratories, medical manufacturing, supply, distribution and service companies to the area.

Residents hope that people who come to work in the neighborhood will decide to live there, too. Maria Angel-Davis, neighborhood program director for the Southwest Garden Neighborhood Association, has said, "We're very excited about it, actually. We hope it will spur a variety of types of development."

The Garden plans to begin construction on the new building in 1995, with completion scheduled for 1997. The next 12 to 18 months offer unparalleled opportunities for individuals and corporations to support the Garden's prominence as a world leader in botanical research by making special naming gifts for the new building.

"This is an extraordinary, once-in-a-lifetime chance to become intimately involved with a facility dedicated to world class research," said Marcia Kerz, director of development. "Strong support from our members and the entire community will be essential as we move forward with the building." Many naming opportunities will be available within the framework of the project. Donors interested in more information about the research facility may write the Development Office, Missouri Botanical Garden, Post Office Box 299, St. Louis, Missouri 63166-0299, or call (314) 577-5120.

The Past

When Henry Shaw gave the Missouri Botanical Garden to the people of St. Louis, he established a heritage that has thrived through the years. But his legacy alone would not have resulted in the abundance we see around us today. Bequests since Mr. Shaw's time, from members and friends of vision, ensured that our heritage could flourish; legacies have been an integral part of every major expansion and program improvement at the Garden since 1889. Making a bequest to the Garden unites you with this heritage and guarantees that our latest beneficiaries won't be the last. To show our appreciation, the Garden established the Heritage Society as a way to honor those whose foresight connects us to the future.

The Heritage of the Garden

The Future

Bequests are a way to help secure the Garden's financial stability. Bequests can be a specified amount, a percentage of an estate, or even the balance of an estate after family and loved ones are considered.

Interestingly, a will is not the only way to make a Heritage gift. The Garden can be the beneficiary of a trust, or a life insurance policy — even a pension plan. Your gift can be undesignated, which gives the Garden the opportunity to use the money where it is needed most, or it can be designated for a specific use.

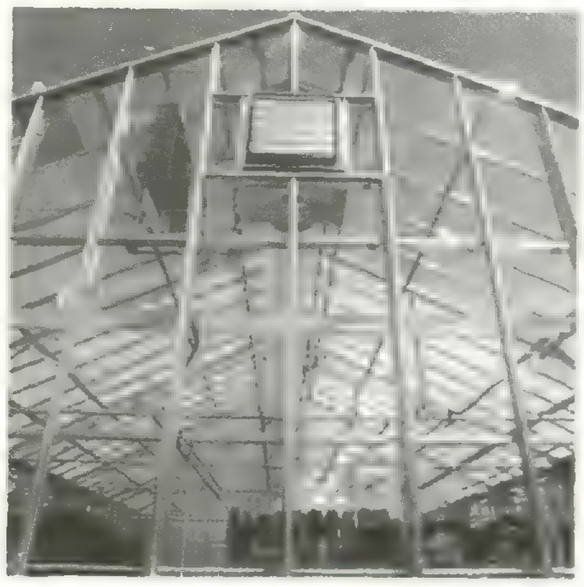
To learn more about the Heritage Society and how you can be part of the vision, call our gift planning office at (314) 577-9532.

The Heritage

Bequests help support the daily operation of the Garden (left and above). Members of the Heritage Society attend the annual Director's Associates Dinner with Dr. Raven and private premiere parties for the annual Flower Shows (right).

The lake in Seiwa-En

The Climatron renovation



The new greenhouses

Chinese botanical specimens

Computers

The John S. Lehmann Building research facility

Through the years, bequests have helped to provide important and beautiful features of the Garden that benefit and delight many people every day.
This page, Bequests helped to fund renovations to the greenhouses during the last capital campaign; computers have been upgraded; an important collection of botanical specimens from China has been added to the herbarium; the shoreline of the lake in the Japanese Garden was preserved; the Climatron and the Lehmann Building were renovated.

What Is The Heritage Society?

- *The Heritage Society is our way to recognize you as a special benefactor of the Garden, either publicly or privately, as you prefer.*
- *The Heritage Society provides you with a painless way to receive estate planning and charitable giving information — information that is understandable and jargon-free.*
- *The Heritage Society is meant for everyone, not just the wealthy and famous — although we welcome them, too.*
- *The Heritage Society has no annual dues, fees, or forms to fill out.*
- *Your gift is strictly confidential — and we will honor your request for any level of anonymity.*
- *Members of the Heritage Society are invited to an annual dinner with Dr. Peter H. Raven and other special donors like yourself.*
- *You will be the first on your block to see the Garden's annual flower shows at the Flower Show Premieres for upper level members.*
- *The Heritage Society is a terrific way to protect the future of the Garden — and a sure way to get a beautiful Garden calendar every year!*
- *The Heritage Society is your link with the continuity of a world class institution dedicated to preserving and enriching life through plants.*

YOU & THE

ENVIRONMENT

Books Help Save the Environment

ENVIRONMENTAL CHALLENGES including solid waste disposal, dwindling natural resources, air and water pollution, and disappearing plants and animals can be addressed through individual and group commitment and action, and solutions can be found. The Garden has committed itself to help in this global effort by practicing environmentally sound horticultural practices, by recycling glass, paper, aluminum, cardboard and other materials, by conserving energy, by composting all plant materials, by safely disposing of hazardous materials in an environmentally acceptable manner, and by helping visitors understand why the Garden has adopted these practices.

As concerned individuals, each of us can help solve environmental problems. The Garden has assembled the following list of books that provide practical suggestions and ideas for both adults and children. These books are generally available in the Garden Gate Shop and in your local book stores.

The Complete Guide to Recycling at Home
by Gary D. Branson. 1991. Betterway Publications, Inc, White Hall, VA. 176 pps.

Covers in detail the handling and recycling of waste paper, thoughtful lawn and garden care, effective composting and use of non-polluting products, water conservation, alternative energy sources and energy conservation, reducing home maintenance, and many more environmentally friendly ideas. The manual offers easy, economical, and technically simple ideas.

EarthScore: Your Personal Environmental Audit and Guide
Donald W. Lotter. 1993. Morning Sun Press, Lafayette, CA. 105 pps.

Rate yourself on household energy use, water, transportation, consumerism, toxic waste, recycling, environmental advocacy, and other environmental areas. Are you a Eco-Tyrannosaurus or an Eco-hero? Find out with this manual. And find out how to change common household practices, helping yourself and the world.

The EarthWorks Group Guides, Berkeley, CA

This series provides many great environmental suggestions and ideas. These guides are essential for all home libraries.

50 Things You Can Do to Save the World
1989. 96 pps.

A classic book with 50 great ideas. Each idea is supported with environmental information under a heading of "Did You Know?" and offers a wealth of suggestions and ideas.

The Next Step: 50 More Things You Can Do to Save the Earth
1991. 120 pps.

A follow-up to the earlier edition that adds more ideas and suggestions. This is the book for people who are ready to take the next step.

The Recycler's Handbook
1990. 132 pps.

A handy home guide for all recyclers: includes information on getting started, what can be recycled, and simple suggestions about how to recycle, reuse, and reduce.

50 Simple Things Kids Can Do to Save the Earth
1990. 156 pps.

A well written, popular guide that offers information to help children understand environmental issues and provides simple and inexpensive ideas that children can put into practice.

50 Simple Things Business Can Do to Save the Earth
1991. 120 pps.

Here is a guide that can help the business person save money as well as reduce the impact of office practices on the environment.

50 Simple Things Kids Can Do To Recycle
1994. 144 pps.

This handy little guide for kids not only includes information on how and what to recycle, but also contains a great deal of educational information to help children understand why recycling is important.

Environmental Literacy: Everything You Need to Know About Saving Our Planet
by Steven H. Dashefsky. 1993. Random House, New York. 298 pps.

This book is a fast, fluent, comprehensive A-to-Z handbook of key words, expressions, and concepts related to the most critical issue facing all of us today -- the state of our planet. The book will help everyone understand the issues and become better informed to participate in the environmental debates that face us today and in the future.

The Garbage Primer: A Handbook for Citizens by the League of Women Voters
1993. Lyons and Burford, New York. 181 pps.

The League of Women Voters has put together a wonderful handbook for adults that is a useful resource conveying technical information in a language that lay persons can understand. The handbook addresses important political, environmental, and economic concerns about garbage in a clear, unbiased manner.

Green Home: Planning and Building the Environmentally Advanced House
by Wayne Gardy. 1993. Camden House, Camden East, Ontario. 208 pps.

A fascinating journey through the complex decision-making involved in building a house with respect for the environment. *Green Home* is a must for anyone who plans to build or buy a house and for those who recognize that the housing decisions we make today will affect the planet we live on forever.

How to Live Green, Cheap, and Happy
by Randi Hacker. 1994. Stackpole Books, Mechanicsburg, PA. 82 pps.

Guidelines on everything from growing your own food to working out in the Earth Gym to bringing back the barter system. Without asking you to give up the comforts of the 20th century, the author ushers in life styles for the new millennium.

Worms Eat My Garbage
by Mary Appelhof. 1982. Flower Press, Kalamazoo, MI. 100 pps.

An expertly written, practical and educational manual that is enjoyable and fun to read. The author tells how you can use earthworms to help recycle your garbage, create compost for your garden, and help to save space in landfills.

— Larry DeBuhr, Ph.D.
Director of Education

Peter Raven (center) presented awards to (from left): Christine Kurtz-Fuerhoff, Katherine Chambers, Sue Oertli, and Iris Guenther.

Below: The Tower Grove House Auxiliary (from left): Jean Crowder, Carol Ann Rechtien, Anita Siegmund, Norma Silber, Norma Hill, Marilyn Raphael, and Gloria Schopp. Not pictured: Nancy Alt, Jeanette Ellerman.

Volunteer Evening 1994

A RECEPTION held in Monsanto Hall on June 21, 1994, paid tribute to the hundreds of men and women who donate their time, expertise, energy, and enthusiasm to the Garden each year by volunteering to help with departmental work. In presenting awards to the individuals recognized this year for outstanding service, Dr. Raven said:

"The citizens of this community depend on us to present the very best, whether it is discovering plants in Africa, teaching children about biodiversity, or lifting the human spirit with beautiful floral displays. Our programs continue to expand, and now we must respond to that demand without the added resources we sought through the Proposition E tax campaign. This is when we realize particularly how important the support of our volunteers has become, since we could not respond to the tremendous demand without your help....The contributions demonstrated by the people we recognize tonight are splendid, and their friendship and camaraderie lighten our day."

Christine Kurtz-Fuerhoff was honored with the **Special Achievement Award** for her work over the past year: she corrected over 2500 pages of Master Gardener weekly homework, gave programs for the Soule Center, and served on the Master Gardener Steering Committee board.

Sue Oertli received the **Extra Service Hours Award**, designed to honor volunteers who give time above and beyond their normal volunteer commitment. Sue has served on the Members' Board since 1977. She developed the Membership Services Desk eleven years ago, has worked on many major events and fundraisers, and still volunteers at the Membership Desk on a regular basis.

Iris Guenther received the **Commitment Award** for her work in mounting plant specimens in the herbarium. This award recognizes volunteers who conscientiously perform the repetitive, often dull tasks so necessary to the smooth functioning of any department. Iris is known for her hard work, but also for her sense of humor and her wonderful smile.

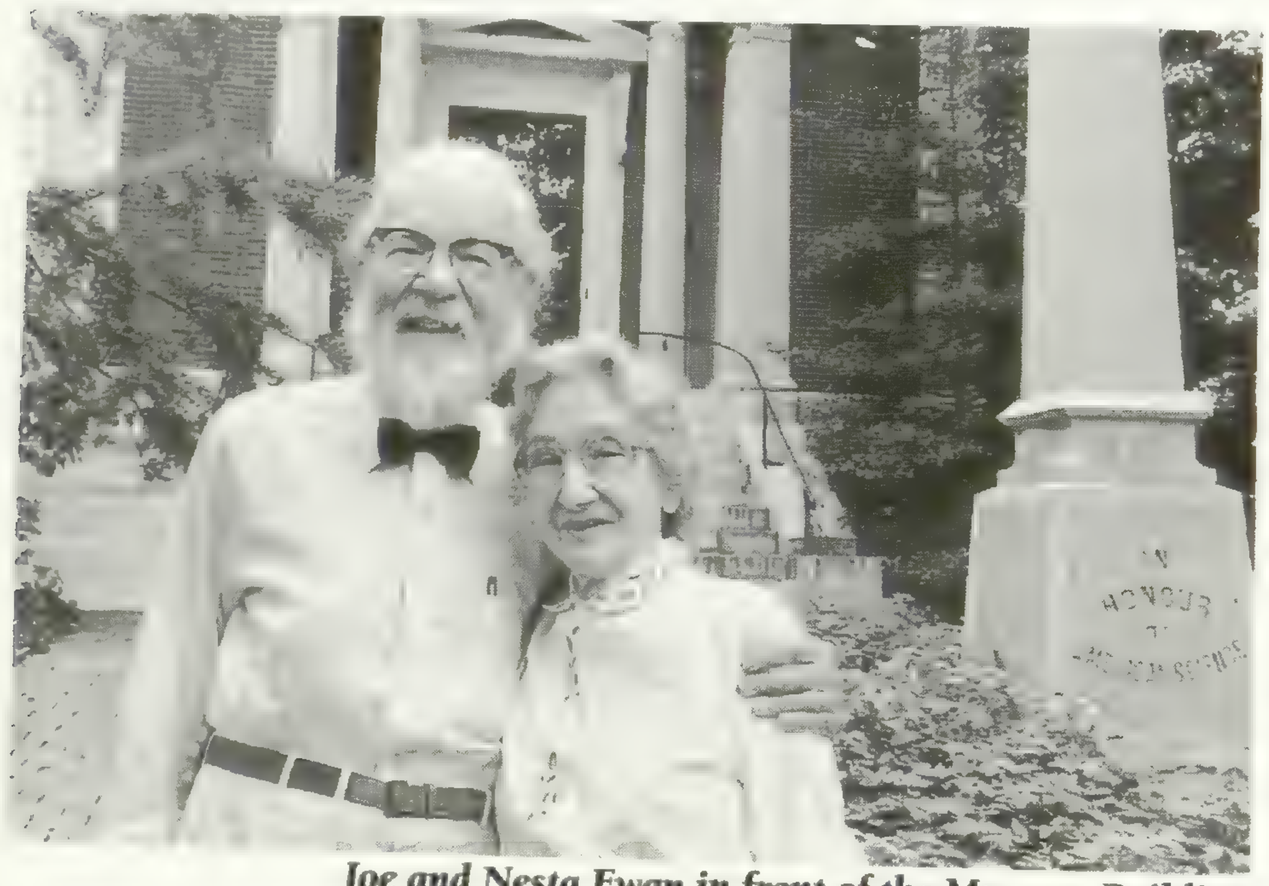
The Organization Award honors the volunteer group with its own organization and governing body that handles its own projects and affairs, makes an outstanding contribution on special projects, and donates many hours or demonstrates outstanding commitment. The **Tower Grove House Auxiliary** operates the Tea Room in Tower Grove House, presents Henry Shaw's Birthday in July and the Candlelight Tours during the holidays, and serves special holiday luncheons. All profits go to support the ongoing renovation and repair of Tower Grove House. These outstanding volunteers take on enormous responsibility and contribute a great deal of time: Nancy Alt, Jean Crowder, Jeanette Ellerman, Norma Hill, Marilyn Raphael, Carol Ann Rechtien, Gloria Schopp, and Anita Siegmund. They are assisted by Norma Silber, manager of Tower Grove House, herself a past president of the Auxiliary.

The **Volunteer Emeritus** award honors an inactive volunteer who has given more than ten years of outstanding service to the Garden. On Volunteer Evening the Garden honored the late **Carol McCloskey** for her work with Tower Grove House and the Master Gardener Program. Carol was a ready teacher with a love of history and growing plants. The Garden staff, members, and friends miss her and were greatly saddened by her death on May 12. Her son Mark McCloskey accepted the award in his mother's memory, and a Rhododendron shrub has been dedicated in her name.

Katherine Chambers received the **Career Service Award**, presented to the volunteer who has made repeated substantial contributions within a single division or in several areas over a number of years. Katherine, a retired teacher for the St. Louis Public Schools and professor for Harris Stowe State Teachers' College, has been a Garden Guide and Volunteer Instructor for many years. She also volunteers at the Science Center, Washington University, the International Institute, the St. Louis Nature Study Society, the Webster Groves Nature Study Society, the Missouri Native Plant Society, and the Audobon Society.

THE GARDEN'S HIGHEST HONOR, the Henry Shaw Medal, will be awarded to Professor Joseph Ewan and Nesta Dunn Ewan on October 26, 1994, in honor of their lifetime achievements as preeminent 20th century interpreters of American natural history. The Medal will be presented at a dinner honoring Henry Shaw Associates and Garden Fellows at the Ritz-Carlton Hotel.

The Ewans are internationally renowned scholars. Born in 1909 and 1908, Joe in Philadelphia and Nesta in Saskatchewan, the couple met while majoring in botany at the University of California, Los Angeles, and were married in 1935. In addition to a distinguished career as a teacher and a field botanist with over 20,000 herbarium numbers, Professor Ewan has published more than 400 books, essays, monographs, and reviews. Mrs. Ewan is closely associated as a research assistant, editor, and in words of David Staff Jordan, "a critic on the hearth." Over the course of 60 years they also have amassed a unique collection of over 5,600 rare and valuable volumes that have answered questions here and around the world.



Joe and Nesta Ewan in front of the Museum Building

Joseph and Nesta Ewan To Receive Henry Shaw Medal

Joseph Ewan developed his scientific career at Berkeley with four years as a research assistant to the famed botanist Willis Linn Jepson, followed by seven years teaching at the University of Colorado, a year in Colombia with the Cinchona Survey for the Foreign Economic Administration, and curatorial appointments with the Smithsonian Institution and the United States Department of Agriculture. In 1947 he was appointed Instructor in Biology at Tulane University, where he taught for 30 years, retiring in 1977 as the Ida Richardson Professor of Botany. A Guggenheim Fellow and Smithsonian Regents' Fellow, Founders' Medalist of the Society for the History of Natural History and recipient of the Botanical Society of America Merit Award, Professor Ewan also holds honorary doctorates from the College of William and Mary and Tulane.

In September, 1986, the Ewan Collection was purchased by the Missouri Botanical Garden, and the Ewans came to the Garden to continue their studies. Announcing the acquisition in 1986, Garden director Peter H. Raven said, "The significance of the collection, its relevance to the work we do, and the respect Joseph Ewan commands in the scientific community make this announcement one of the most exciting I've made while at the Garden." The collection is housed in the 1859 Museum Building, a fitting home for what has been called one of the world's most comprehensive collections on the history of natural history.

The Ewan Collection is centered on the history of biology and biography of scientists, travel and exploration, history of entomology, conchology, ornithology, and geology, besides rarer botanical works. The collection includes presentation copies and foreign language editions, volumes annotated with the authors' notes, and personal papers and correspondence that provide significant primary source material.

Currently the Ewans are arranging for publication a biography of Benjamin Smith Barton, the physician-naturalist who worked closely with Jefferson and fundamentally influenced American natural history. *Andes and Amazon*, a bio-bibliography of travel narratives of naturalists in South America, is in progress. A project by the Garden library to catalogue the Ewan Papers, their collection of correspondence and other personal papers (see below), will make readily accessible a wealth of insights into the lives and activities of 20th century scientists. Noteworthy are the records of biologists working in the American tropics at this time of transition, when native vegetation is passing from being pristine or little affected by habitat destruction to today's ecological devastation.

Extraordinary teachers are born, not made, and Joseph Ewan is a prime example. "Knowledge is so much more than a collection of isolated facts," he is fond of saying. "The interrelationships among disciplines yield a far deeper insight. For example, knowing about insects illuminates the understanding of pollination. Understanding a botanical specimen involves knowing when, where and why it was collected, at what season, and what forces may have influenced its development." Certainly Joe and Nesta have influenced generations of students. As biohistorians Edmund and Dorothy Berkeley prefaced their recent collection of John Bartram letters: the Ewans' "lifelong dedication to the study of the history of American botany, and whose generous assistance to others so engaged, has been an inspiration to many."

Joseph Ewan says, "I always tell my students that there are two most important things to study: the history of the meanings of words, and the history of weeds. Words because they are the mortar that connect the bricks of facts; and weeds, fascinating, aggressive, resilient, adaptable and successful life forms all over the world." He feels as biologists the drive to know, to understand, is primarily genetic, partly environmental — and the Garden, he says, is a wonderful environment. He refers to it, and to his collection, as "a seedbed, a place where the enthusiasm for learning can take root in a susceptible individual and flourish. When that happens, one can experience the elation, the fun, of learning, of being carried away by a passion for knowledge."

That enthusiasm enlivens Joe and Nesta Ewan and all those who are fortunate enough to spend time in their company.

Volunteers Needed — Library Receives Grant for Ewan Papers

The Garden Library has received a $15,456 grant from the National Historical Publications and Records Commission (NHPRC) to process the research and personal papers of Joseph Ewan. In addition, the Garden is grateful to Mr. Charles F. Cook for donating over $2,500 to the project. The funds will enable the Garden to purchase a computer for use on the Ewan project. Volunteers are needed to assist with the processing of the Ewan Papers. They will enter information on the computer and do clerical work. To apply, please call Jeanne McGilligan at (314) 577-5187.

OLIVE OIL & HERBS
Extra virgin imported olive oil infused with the rich fragrance of rosemary or basil and garlic to create an incomparable oil for all your favorite recipes, one that needs no refrigeration. And coming soon: light tasting cannola oil flavored with hot red peppers, thyme, or lemon!

DRIED HERBS
Locally grown and packaged for the peak of flavor, these pesticide-free herbs include all your favorites: basil, oregano, thyme, rosemary, garlic, and whole black peppercorns. Sold in individual jars or assorted gift packs.

DRIED SHIITAKE MUSHROOMS
Organically grown in the Missouri Ozarks by Bald Eagle, Inc., these succulent dried mushrooms impart an incomparable rich woodsy flavor and aroma to soups, sauces, hors d'oeuvres, and all your favorite recipes.

FRESH SALSA
Spark your meals with the vibrant colors and flavors of fresh tomatoes, chilis, onions, cilantro, herbs and spices, in a chunky concoction that's not too hot, not too meek — just right.

FRESH BEAN DIP
Olé! This lively combination of pinto beans, peppers and spices is hearty, flavorful, and has NO FAT — enjoy!

BARBEQUE SAUCE
Everyone claims theirs is the best, but but this is the one they'll ask for again and again. Deep and dark, thick with spices and brown sugar, rich with the flavor you've been looking for — this one is The Ultimate. Use it as a marinade, basting sauce, even baked with your favorite beans!

FRESH CON QUESO
Real cheddar cheese and spicy chilis combine for a luscious dip, or make baked chicken into a special treat.

COMING SOON — HERBS DE PROVENCE
A wonderful taste of the South of France in a fragrant blend of herbs, fennel, and orange peel.

RECIPE FOR JUDY'S BAKED BEANS
A working woman's delight! Drain and rinse three cans of your favorite beans — pinto, navy, Great Northern, black, or a combination — and combine in a baking dish with a chopped onion and two cups of Missouri Botanical Garden Barbeque Sauce. Heat through and serve to six lucky people.

A NEW TASTE

Fresh from the Garden

Have you ever wished you could take some of the delights of the Garden home with you — or share them with a friend far away? Now you can! The Missouri Botanical Garden introduces an exciting new line of herbs, spices, and condiments, straight from the kitchens of Ces & Judy, the talented chefs of the Gardenview Restaurant. These charming jars and gift packs are competitively priced, just right for holiday gift giving.

Preview these wonderful new gift ideas at the "Best of Missouri" Market October 9!

Home Gardening

A THREAT TO OUR STATE TREE?

SINCE the late 1970s, the fungal disease "dogwood anthracnose" has caused decline and mortality of dogwood trees in northeastern forests. In the late 1980s the disease moved into forests of southern states along the Appalachian Mountains and this year has been found by forest pathologists with the Missouri Department of Conservation.

The disease is associated with hundreds of small, nursery-grown dogwood trees brought into Missouri, Kansas, and Indiana. Because flowering dogwood, *Cornus florida*, is our state tree and perhaps our most popular flowering landscape tree, there is great concern that the disease will wipe out dogwoods the same way killer diseases destroyed elms, chestnuts and oaks.

A multi-state effort is underway to locate and destroy infected plants introduced into Missouri, Kansas and Indiana. This will be difficult since many plants were sold cash-and-carry. If you bought a flowering dogwood this year, inspect it closely for twig blighting and blotched leaves. Samples can be confirmed by a University Extension agent or Department of Agriculture official or Plant Doctors at the Kemper Center for Home Gardening.

How Great Is the Threat?

As far as we know, the disease is not presently here in our native forest dogwood population. Therefore, the disease will probably be introduced by infected ornamental dogwoods sold to people planting residential properties. Careful purchase, correct planting, using resistant dogwood species, and good maintenance practices will slow or avoid problems associated with this disease.

What to Look For When You Buy

Don't expect to see dogwood anthracnose on your older landscape trees just yet. Because the disease was introduced via infected nursery stock from out-of-state growers, it is likely that only small trees planted this summer might show symptoms of the fungal disease. However, when you buy a dogwood tree, you should check it carefully. Generally avoid trees with leaves showing pinpoint purple spots. If this symptom is used alone to screen tree selections, keep in mind that there are several leaf spotting fungal diseases of dogwood which do not pose a real threat. In fact, you will probably see these periodically on established landscape trees. However, leaf spotting combined with blighted leaves displaying larger, tan blotches surrounded by purple margins is more tell-tale of the anthracnose disease.

The same fungus that causes leaf infections also infects twigs and branches. Avoid buying trees with shrivelled twigs or dead branches as well as trees that display succulent "watersprouts" on the lower main stem. Sprouting also can be a symptom of a general top decline associated with other stress factors. Watersprouts are very susceptible to the disease and are the quickest avenue to leaf infections growing down into the main stem, where cankers will form. Active cankers eventually restrict the flow of water and nutrients and lead to death of a tree. In general, buy nursery-grown trees that have been certified as "disease free" by the state department of agriculture's plant inspection division.

Planting Site

Because dogwood anthracnose was shipped into the state, the good news is that it has not become established nor demonstrated its ability to spread in our climate, yet. Researchers indicate that the disease organism has a hard time surviving hot summer temperatures and may die out with short exposures of 95°F. Dogwood mortality in northeastern forests has been correlated with populations growing in extremely shady, humid sites and poorly drained, wet soils. The disease also has terminally affected trees growing in full sun exposures, but to a lesser extent.

While it is tempting to have a beautiful dogwood in front of your picture window, one of the biggest mistakes is to plant where the tree receives a full day of sun. Dogwoods' root systems are shallow, which makes them prone to summer water stress and sunscald.

Dogwoods flourish where soils are well drained, surface mulched with leaf litter, and on sites receiving a maximum half day of full sun. These growing conditions are similar to dogwoods' native habitat in our forests and pose the least risk of anthracnose infection, as well as lowering the incidence of insect attack, particularly by borers.

Resistant Dogwoods

Most of the damage by anthracnose disease has been done to the eastern flowering dogwood, *Cornus florida*. However the Pacific dogwood, *C. nuttallii* is not immune either. Researchers suggest using the more resistant Asiatic dogwood, *Cornus kousa*, or the pagoda dogwood, *Cornus alternifolia*, as substitutes. Both have later flowering times and different flower forms and are underutilized by homeowners. More important, selecting these dogwood species will increase the diversity of trees in our landscapes. We have learned from Dutch elm disease about the lessons of mass plantings of one species.

Recently Rutgers University has been cross breeding *C. florida* with *C. kousa* to enhance resistance to dogwood borer, and has found that hybrid trees are also resistant to anthracnose disease. The six different hybrid tree selections represent a positive intervention by man to combat both insects and disease. These hybrids are now available from retail nurseries.

Take Care of Those Trees!

When you get right down to it, dogwood anthracnose is probably not, nor ever will be, the number one threat to landscape dogwoods planted in warmer parts of the country, including the lower Midwest. Pathologists who have studied this disease and its host believe that string-line trimmers and lawn mowers remain the biggest enemies of landscape dogwoods, damaging the trunks of trees and making them vulnerable to fungi. Just plain good maintenance is the best formula for surviving an impending epidemic. Recom-

DIRECTORY

Regional Plant Societies

The list below includes many of the plant societies that are active at the Missouri Botanical Garden. Names and telephone numbers for contact persons change frequently; please call the Kemper Center for Home Gardening at 577-9440 with changes, additions, or to obtain more information.

African Violet Council *Ardath Miller* 394-9190
Bonsai Society of Greater St. Louis *Peter Van Mier* 727-9191
Boxwood Society of the Midwest *Sheila Hoffmeister* 846-8430
Dahlia Society of Greater St. Louis *Ellis Evans* 843-3767
Daylily Society of Greater St. Louis *John Eiseman* 991-2838
East Central District Federated Garden Clubs of Missouri
Gardeners of America (formerly Men's Garden Clubs of America)(Ozark Region) *Russell McClellan* 837-2470
Gateway Chapter of the North AmericanRock Garden Society *June Hutson* 577-9402
Gateway West Gesneriad Society *Christa Rariden* 776-2823
Henry Shaw Cactus Society *Pat Thomann* 773-2931
Ikebana International
Iris Society of Greater St. Louis
Mid-America Regional Judging Committee of the American Orchid Society *David Brown* 727-2385
Mid-America Regional Lily Society *Fred Winterowd* 423-5313
Missouri Botanical Garden Daylily Society *Mirko Bolanovich* 965-7471
Missouri Mycological Society *Ken Gilberg* 458-1458
Missouri Native Plant Society *George Yatskievych* 577-9522
Missouri Orchid Society *Ron Taube* 961-0577
O'Fallon Iris Society *Roy Bohrer* 240-8780
Orchid Society of Greater St. Louis *Diana Plahn* 965-5007
Rose Society of Greater St. Louis *Carole Sebastian* 993-9270
Saintpaulia Society
St. Louis Evening Herbalists *Marilyn D. Miller* 481-0755
St. Louis Herb Society
St. Louis Horticultural Society
St. Louis Water Gardening Society
West County Daylily Club *Roy Bohrer* 240-8780

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mended maintenance includes:

1. Mulching around the base of trees and supplying water during drought periods

2. Prune selectively after fall leaf drop to open up the canopy and increase air circulation. Remove dead limbs and twigs immediately. Use sharp tools and disinfect with a 1:9 bleach/water mix between cuts.

3. Fertilize only according to soil test reports. Over fertilization will promote disease and insect problems.

4. Avoid mechanical injury to the main trunk from garden equipment. Protect tree root systems from construction injury

5. Monitor for bark and leaf diseases as well as boring insects. Chemical treatments are rarely required if problems are diagnosed early.

—Steven D. Cline, Ph.D.
Manager, Kemper Center for Home Gardening

TELEPHONE HELP

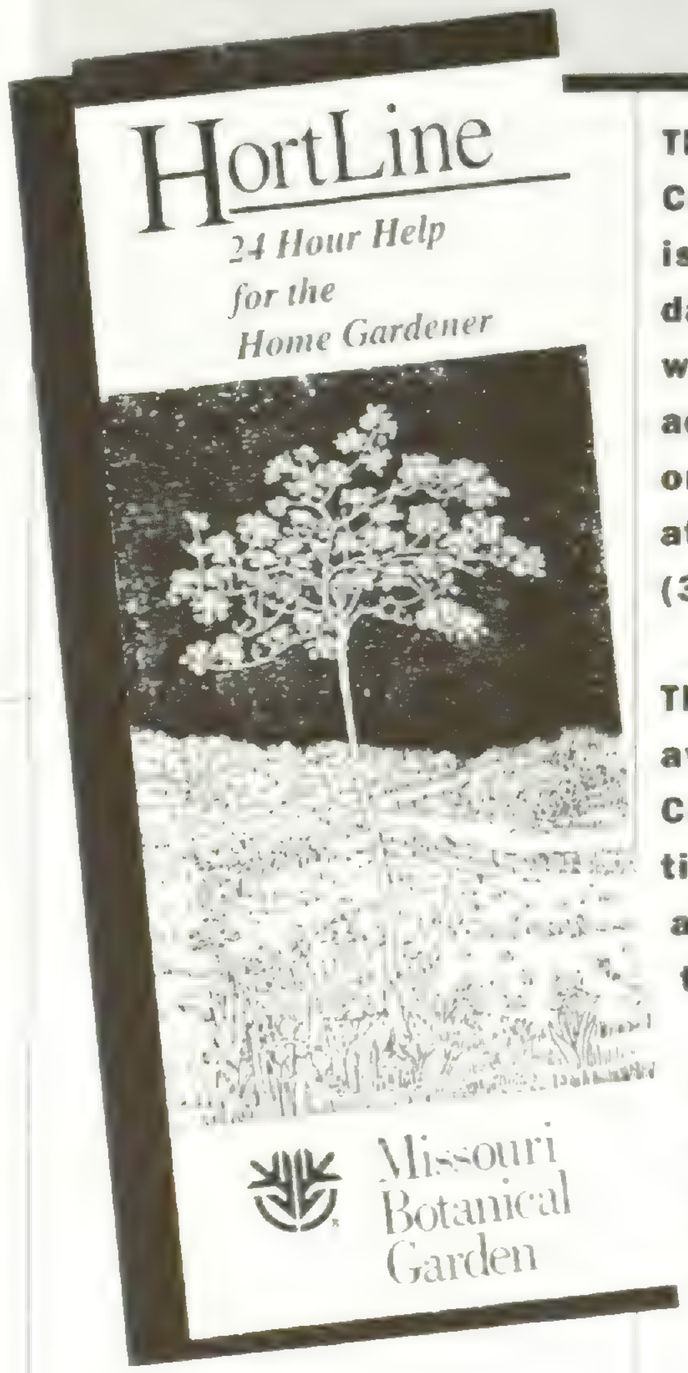
The Garden has several telephone services available to assist you.

GardenLine **577-9400**
24-hour recorded information about Garden events, hours, admission and directions. Outside area code 314, call **1-800-642-8842** toll free, 24 hours a day

Horticultural Answer Service (314)577-5143
Monday through Friday, 9:00 a.m. to noon, Master Gardeners are on hand to answer your gardening questions.

Master Composter Hotline (314) 577-9555
9:00 a.m. to noon, Monday through Friday. Specially trained Master Gardeners are on hand to answer your questions about yard waste management techniques. After hours leave a message and your call will be returned. The Master Composter program is supported by the Monsanto Fund.

HortLine **(314) 776-5522**
24-hour recorded gardening information is available with a touch tone telephone. You will need a brochure listing the hundreds of HortLine topics in order to use the service; you may **request a brochure** by calling the Kemper Center for Home Gardening at (314) 577-9440, 10 a.m. to 4 p.m. daily, or send a stamped, self-addressed envelope to HortLine, Kemper Center for Home Gardening, Missouri Botanical Garden, P.O. Box 299, St. Louis, MO 63166-0299.



The William T. Kemper Center for Home Gardening is open 10 a.m. to 4 p.m. daily. Admission is free with regular Garden admission. For information on classes and activities at the Center, please call (314) 577-9440.

The Plant Doctor is available at the Kemper Center for walk-in consultations from 10 a.m. to noon and 1 to 3 p.m. Monday through Saturday.

Call HortLine for recorded gardening information 24 hours a day!

Calendar

october 22 saturday — november 13 sunday

Fall Flower Show

9 a.m. to 5 p.m. daily, Orthwein Floral Hall. A colorful display, inspired by the abstract paintings of Piet Mondrian, features fountains, pools, and waterfalls in an array of geometric shapes and levels, splashing amid vibrant plots of brilliantly colored mums, sunflowers, zinnias, seasonal flowers and grasses. Free with Garden admission. See October 21 for the Members' Preview Party.

september 1–5

thursday–monday

"The World I See"

9 a.m. to 8 p.m. daily, Monsanto Hall. Colorful posters painted by St. Louis and Japanese schoolchildren are on display before traveling to Kyoto, Japan. Free with Garden admission.

september 3–5

saturday–monday

20th Annual Japanese Festival

9 a.m. to 8 p.m. daily, Ridgway Center and grounds. Music, dancing, martial arts, food, arts and crafts, displays of bonsai and ikebana, and more! Admission: $2 members, $6 non-members ages 13-64; $4.50 for non-members age 65 and over; children 12 and under are admitted free accompanied by an adult. Saturday until noon, admission for non-members ages 13 and over is $3. See schedule available at ticket counter; additional fees are required for some workshops and activities.

september 8 thursday

Hans Droog: "The Best of Missouri"

9 a.m. to 5 p.m. daily through October 10, Monsanto Hall. An exhibit of paintings by St. Louis artist Hans Droog depicts rural scenes and agricultural themes. Free with Garden admission.

september 15–18

thursday–sunday

Fall Bulb Sale

Members' Pre-Sale, 9 a.m. to 6 p.m., Thursday and Friday; sale opens to the public, 9 a.m. to 5 p.m., Saturday and Sunday. Garden Gate Shop and Orthwein Floral Hall. Beautiful bulbs, hardy mums, and lots of wonderful garden gifts and accessories. Members receive a 20% discount all four days.

september 18 sunday

Daylily Association Plant Sale

9 a.m. to 5 p.m., or until sold out; Ridgway Center. The Missouri Botanical Garden Daylily Association holds its annual sale of extra plants from the Garden's daylily collection, with all proceeds going to benefit the Garden. Come early for best selection!

september 24 & 25

saturday & sunday

Dahlia Flower Show

9 a.m. to 5 p.m. daily, Orthwein Floral Hall. The Greater St. Louis Dahlia Society welcomes exhibitors from throughout the seven-state Midwest Conference. Colorful arrangements and individual blooms will be judged and displayed. Free with Garden admission.

wednesdays & saturdays

Garden Walkers' Breakfast

7 a.m., grounds. In cooperation with the American Heart Association, the grounds open early every Wednesday and Saturday morning to encourage fitness walking. Greenhouses open at 9 a.m. Breakfast is available for purchase in the Gardenview Restaurant, 7 to 10:30 a.m. Admission is free on Wednesdays and Saturdays until noon.

every day

Free Walking Tours

1 p.m. daily. Meet the Garden Guides at the Ridgway Center ticket counter, rain or shine, for a fascinating tour of the Garden. Free with regular admission.

september 28

wednesday

"I Love Eating" Class

11 a.m. to 12:15 p.m., Kemper Center for Home Gardening. Today's topic: "Cooking with Spirit – How Wine and Liqueurs Work in Foods and Affect Your Health." Nutritionists from the American Heart Association sort through the maze of information and demonstrate some delicious recipes. Sponsored by the Garden in conjunction with the American Heart Association and the Missouri Soybean Merchandising Council. Classes and admission are free, but reservations are required: please call 45-HEART or 1-800-255-9919 to register.

october 8 & 9

saturday & sunday

Historic Shaw Art Fair

10 a.m. to 5 p.m. Saturday, 10 a.m. to 4 p.m. Sunday, on Flora Place just east of the Garden's Spink Pavilion. The works of 100 artists will be on display for sale, sponsored by the Shaw Neighborhood Improvement Association. Admission is $3 per adult, $2 with flyer available at the Garden, free to children age 14 and under if accompanied by an adult. Call (314) 773-3935 or (314) 569-0378 for more information.

october 9 sunday

"Best of Missouri" Market

10 a.m. to 5 p.m., grounds. See page 16 for details.

october 21 friday

Members' Preview: Fall Flower Show

5 to 8 p.m., Ridgway Center. Members get an advance look at the first Garden flower show of the winter season. Entertainment, cash bar. Dinner buffet available in the Gardenview Restaurant; Garden Gate Shop will be open. Free, for members only. *See highlight.*

october 22 & 23

saturday & sunday

Fall Lily Sale

9 a.m. to 5 p.m. daily, Ridgway Center. The Mid-America Regional Lily Society holds its annual fall bulb sale.

october 26 wednesday

"I Love Eating" Class

Today's topic: "The Roots of Great Health: Favorite Veggies from Below and Above the Ground." Join food and nutrition experts as they unearth ways to make carrots, rutabagas, parsnips and their relatives into delicious autumn recipes. *See September 28 for details.*

october 29 thursday

25th Anniversary Celebration: Missouri Coalition for the Environment

For 25 years the Missouri Coalition for the Environment has worked to protect and enhance our state's air, water, and soil. Garden members and the public are invited to share in a special evening that celebrates the anniversary of the founding of the Coalition, which was incorporated at a meeting held at the Garden in 1969. Dr. Peter H. Raven will serve as master of ceremonies, and the stars of television's "Donnybrook" will take to the stage with "Donnybrook Looks at the Environment." Cocktails, $25; dinner, $50; or $75 per person for the evening. Please call (314) 727-0600 for more information and reservations.

Members' Days

september 21 wednesday

Festive Floral Decorating

10 a.m., Shoenberg Auditorium. Join award-winning floral designers from Ladue Florist, Inc. for the latest tips and tricks for creating your own lovely decorations for the autumn and winter holiday season. Attendance drawing; seating is limited. Free, for members only.

october 11 tuesday

"A Step Back In Time..."

10 a.m., Shoenberg Auditorium. Norma Silber, manager of Tower Grove House, presents a slide lecture on the history of Henry Shaw's country home, followed by tours of the House from 11 a.m. to 1 p.m. Lecture and tours are free, for members only; seating is limited. Also, enjoy luncheon in the Tower Grove House Tea Room from noon to 1 p.m. Reservations for luncheon are $9.75 per person, gratuity included, and must be paid in advance. Please call (314) 577-5150 to make reservations, and make checks payable to Tower Grove House Auxiliary.

coming november 12 1994

"Tour de France"

le chateau village, frontenac

A gala evening of music, dancing, and the glorious food and wines of France

All Garden members are invited to this delightful party for the benefit of the Missouri Botanical Garden. Tickets are $100 per person. Please call (314) 577-9500 for reservations and more information.

Members

Third Annual

"Best of Missouri" Market

Sunday, October 9, 1994

10 a.m. to 5 p.m.

Admission: $2 per person for members; $6 per person for the public (includes Garden admission); free to children under 12.

Sponsored by: ***Commerce Bank of St. Louis; Premier Homes;***
Boatmen's National Bank of St. Louis; St. Louis County Farm Bureau

Entertainment

Country & Bluegrass Music on Spoehrer Plaza

Food

Brats, Barbecued Pork Loin, Deep Fried Missouri Catfish, Slaw, Potato Salad, Sandwiches, Pastries, Soft Drinks & Beer

Produce

Fruit	*Sauces*
Fish	*Vegetables*
Herbs	*Pumpkins*
Preserves	*Mushrooms*
Soaps	*Wines*
Nuts	*Baked Goods*
Candies	*Relishes*
Meats	*Pickles*
Honey	*Gourds*
Cider	*Gift Baskets & More*
Dressings	
Popcorn	

Displays

Agriculture Displays, Canning Demonstrations, and a Petting Farm

Crafts

Hand-Thrown Pottery • Willow Furniture Garden Accessories • Carved Wooden Birds Hand-Spun & Woven Fabrics • Clay Tile • Candles • Wooden Boxes • Dried Flowers & Wreaths • Decorative Ironwork • Angora Yarn Baskets • Missouri Wildflower Jewelry

Missouri Specialty Growers

Bowood Farms, Clarksville
Hamilton Seeds
Hartke Nursery
Missouri Wildflowers Nursery, Jefferson City
Nicholson Bonsai Studio, St. Louis
S & S Aqua Farm

"Signature Collection" of MBG Plants

400 plants propagated from the Garden grounds, greenhouses, and the Arboretum, including many native Missouri species.

Attendance Drawing for Fabulous Missouri Prizes – Watch your mail for details of the event!

Special Entrances

Enter at the corner of Alfred & Magnolia; Spink Pavilion on Tower Grove; or the main entrance on Shaw. For more convenient parking arrange a car pool, or take MetroLink and the Number 13 Bi-State bus direct to the Garden!

Plus—The Historic Shaw Art Fair-
October 8 & 9

100 artists exhibit along Flora Place,
10 a.m. to 5 p.m. Saturday,
10 a.m. to 4 p.m. Sunday.

$3 per person, $2 with flyer available at the Garden; children age 14 and under free if accompanied by an adult.

Members' Admission Prices for Japanese Festival

This year, Garden members are asked to join the general public in paying admission to the Japanese Festival. At this time of greater and greater demands on the Garden's resources, we appreciate our members' support more than ever; unfortunately it is no longer possible to make the Japanese Festival available free to our members.

Admission to the Japanese Festival is $2 for members; $6 for non-members ages 13 to 64; and $4.50 for non-members age 65 and older. As always, children under 12 are admitted free and must be accompanied by an adult. These prices cover both general Garden and Festival admission.

On Saturday, September 2, from 7 a.m. to noon, admission is $3 for non-members 13 and older; $2 for members, children age 12 and under are admitted free and must be accompanied by an adult. These prices cover Festival admission; admission to the Garden is always free to all on Saturdays until noon.

Many performances and activities are included with Festival admission. However, admission prices do not include certain performance and activity tickets that must be purchased separately for select Festival events. Please consult a schedule, available when you purchase your admission.

Your Membership Discount– A Reminder to Our Members

Members are reminded that they must show their membership cards in the Garden Gate Shop to receive the members' ten percent discount on purchases. This is a special benefit reserved for Garden members, who are requested not to loan their cards to non-members who wish to make purchases in the Shop. All proceeds from the Garden Gate Shop go to benefit the Garden, and we deeply appreciate the members who extend their support by respecting the special discount privileges.

Buy or Renew a Membership and Get a Three-Day Pass to the Festival!

Buy or renew a membership to the Garden during Labor Day Weekend and receive a FREE three-day pass to the Japanese Festival. The pass provides general admission to the festival, not valid for individually ticketed festival performances.

A Garden Member's Top Ten Reasons To Support The Henry Shaw Fund Year-End Appeal:

1. See the "Top Ten Reasons" contest below!

2. Watch your mail for this one!

3. I want St. Louis to continue to be home to the finest botanical garden in the world. Annual giving helps to support every facet of daily operations at the Garden.

4. The carp in the Japanese Garden lake need to maintain the standard of eating to which they have become accustomed. Indeed, the largest Japanese Garden outside Japan needs daily care to prune, feed, rake, and maintain its wonderful trees, shrubs, lake, and architectural features.

5. I am a senior citizen who needs to boost current income, and there is a special gift to the Garden that does that. The gift helps both me and the Garden — what a concept!

6. I sure could use an income tax deduction.

7. The Climatron just wouldn't be the same without waterfalls. Annual giving helps to maintain all the services behind the scenes — such as plumbing, electric, and water systems — that are so easy to overlook.

8. Tower Grove House is my favorite place to bring guests for holiday lunches, to be the perfect host and pretend I am a land baron. Annual giving is specifically designated to cover operating costs throughout the Garden, expenses such as caring for gutters, painting, tuckpointing, and more.

9. I sure could use an income tax deduction!

10. When I need gardening information, I don't have hours to find the right answers. With the Horticulture Answer Service and HortLine, help is as close as my phone. These services would not be available without help from annual giving.

"Top Ten Reasons" Contest

As you can see, we already know a lot of good reasons why it is so important to give to the Henry Shaw Fund Year-End Appeal. We would like to hear the reasons why the Garden is important to *you*, and why everyone should participate in the year-end appeal. Whether you have one reason or ten reasons, tell us what makes the Garden what you love -- every day!

If your reason is chosen to headline the 1994 Year-End Appeal campaign, you or a friend you designate will win a $500 Director's Associate membership for a full year, with all of the benefits of upper level membership including the annual recognition dinner. You'll also have the satisfaction of knowing that you have been a key participant in one of our most important fundraising efforts.

Submit your ideas in writing to: Henry Shaw Fund Year-End Appeal Contest, Development Office, P.O. Box 299, St. Louis, Missouri 63166-0299.

Cecil Wood with his parents, Cecil and Pearlie Wood

Cecil G. Wood III Awarded the Just Scholarship

In July the Garden announced the awarding of the 1994-95 Dr. Ernest E. Just Scholarship to Cecil G. Wood III of St. Louis. The $5,000 renewable scholarship is awarded to African-American undergraduates from St. Louis majoring in biological science.

Cecil is a junior at Washington University in St. Louis and is pursuing a double major in biological and engineering sciences and Spanish, working toward a career as a doctor in genetic engineering. He graduated from John Burroughs High School where he was a National Merit Scholar, National Achievement Scholar, and AP Scholar with Distinction.

At Washington University, Cecil has been honored with the John B. Ervin Scholarship Program and the Scholars' Program in Medicine. He is assured admission into Washington University Medical School upon graduation from the undergraduate program with his continued level of academic performance. His extracurricular activities include serving as international editor for the Washington University Window, committee chair for the cultural celebration committee, committee chair for the pre-medical society, and membership on the Washington University film society, Filmboard.

"Cecil is the third St. Louisan to receive the Garden's highest honor for undergraduate achievement," said Dr. Peter H. Raven, director. "His record and his accomplishments are outstanding. his future is exceptionally bright and the Garden is proud to be a part of his education."

The Just Scholarship is named for Dr. Ernest E. Just, an African-American scientist recognized for his brilliant research work in biology focusing on human cells. The Missouri Botanical Garden began awarding the Just Scholarship in 1992. Previous recipients include Ms. Pamela Hughes and Kevin Ferguson, both of St. Louis.

The Garden encourages African-American college sophomores studying science to inquire about the Just Scholarship by writing the Missouri Botanical Garden, Education Division/Just Scholarship Program, P.O. Box 299, St. Louis, Missouri, 63166.

E. Desmond and Mary Ann Lee Family Education Center

The building at 4475 Castleman will be renovated to provide additional offices, classrooms, and storage facilities for the Garden's Education Division.

Mr. and Mrs. E. Desmond Lee have made the lead gift to acquire the building at 4475 Castleman, near the corner of Vandeventer and Shaw, to provide additional facilities for the Garden's Education Division. The building, which formerly housed Paraquad, will be remodelled as space for offices, classrooms, and storage.

In April, 1994, Mr. and Mrs. Lee and their family announced a gift to create a program for science education for under-served urban schools. The program supports the work of the Garden, the St. Louis Science Center, and the Saint Louis Zoo.

"The new building is a wonderful addition to our facilities," said Dr. Larry DeBuhr, director of education for the Garden. "Our education programs have grown dramatically in recent years, and these new facilities will provide additional office space, classrooms for the Henry Shaw Academy afterschool and Saturday programs, and expanded facilities for teacher training. The staff will communicate directly with the Ridgway Center through a computer network."

Dr. Peter H. Raven, director, said, "We are deeply grateful to Des, Mary Ann, and their family for their ongoing support of our education program. This new facility represents our ongoing commitment to serve the people of St. Louis and our neighborhood."

GARDEN GATE SHOP

Receive 15% Members' Discount on Holiday Cards When You Order by Mail!

1994 MBG Holiday Card

THE 1994 Missouri Botanical Garden Holiday Card is a charming view of Tower Grove House, complete with Henry Shaw and his friends and family enjoying a sleigh ride. This whimsical scene is painted in full color by local artist Ann Thompson, the third in her series of Garden cards for the holidays.

This year it is even easier to support the Garden by sending these delightful cards. If you order by mail you will receive a 15 percent discount plus shipping and handling; or purchase cards in the Garden Gate Shop at the usual ten percent members' discount. Cards come in sets of 12 with 12 envelopes for $12.00 per box. Watch your mail for the special flyer, use the order form at right, or call the Shop at (314) 577-5136 Monday through Friday, 9 a.m. to 5 p.m.

Order Form

☐ Enclosed is my check or money order for $_____, payable to Missouri Botanical Garden

Please charge: ☐ MasterCard ☐ Visa

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1995 Garden Calendar

1995 MBG Calendar

The new Missouri Botanical Garden Calendar for 1995 is available in the Shop, with wonderful new full color photographs by Jack Jennings. The 16" x 12" poster-size calendars include a full color poster on the *Flora Mesoamericana* Project and the Garden's research program, and are priced at $10.95. Members receive a ten percent discount, plus shipping and handling. Call (314) 577-5136 Monday through Friday, 9 a.m. to 5 p.m., or use the order form above.

Annual Fall Bulb Sale– Members Take 20% Discount

Members' Pre-Sale: *Thursday and Friday, September 15 and 16, 9 a.m. to 6 p.m.*
Sale Open to the Public: *Saturday and Sunday, Sept. 17 and 18, 9 a.m. to 5 p.m.*

A spectacular special sale of bulbs and colorful hardy mums, plus the best in flowering plants, books, gifts, and gardening accessories. Members receive 20 percent off all merchandise, all four days.

Garden Clubs Offer Landscape Design Course

The Federated Garden Clubs of Missouri, Missouri Landscape Design Critics Council, and the Garden, in cooperation with the National Council of State Garden Clubs, will present the third in a series of four annual Landscape Design Courses at the Kemper Center for Home Gardening on October 3,4, and 5, 1994. Participants need not have taken earlier courses to take Course III. The classes are designed to benefit both professional and amateur horticulturists and are intended as a public service to educate interested persons about good landscaping practices.

Attendance is limited to 70 people. There is an optional reading list and written examination for those seeking to become members of the Landscape Design Critics Council. The course fee is $50; the fee for one day is $25. For more information and registration, call 532-3232 or 993-1836.

News from Shaw Arboretum

Ecological Imbalance Threatens Biodiversity

In Africa, elephants are converting forests to grasslands as they knock down trees to eat the leaves. On the American great plains, prairie dogs are close-cropping many plant species in prairie dog towns. Closer to home, yet now well known to most Garden members, are the changes occurring in American woodlands resulting from surging populations of deer.

Among the general public it is unimagined by some and controversial to others that the deer which grace our woodlands can be a force of destruction. It is not merely a problem of deer nibbling shrubs and garden plants in suburban backyards, but is in fact a serious ecological problem in "protected" natural areas throughout the region.

First reported in the 1930s by Aldo Leopold, damage caused by deer was noticed by ecologists decades ago. Since then, a growing body of scientific studies demonstrates that deer are the cause of many disturbing changes in North American forests. Many articles on the deer problem have appeared in publications ranging from *Reader's Digest* to the technical journal *Conservation Biology*. A recent article in *American Forests* magazine (November/December 1993) is the most complete presentation of the data in the popular press.

The best available estimates indicate that deer occurred in populations of five to fifteen square-mile at the time of European settlement. Forests within this range of deer numbers today are the healthiest in terms of plant diversity, both in wildflower abundance and number of seedling and adult tree species, and in the diversity of animals that depend on the plants. Forests with greater than 15 deer per square mile show signs of decline. Those with over 60 deer per square mile, common in many midwestern and eastern U.S. woodlands today, show about 30 percent reduction in sapling height and species representation, about 35 percent reduction in songbird abundance, and a shocking 300 percent reduction in wildflower abundance. All other forest life is ultimately dependent on plant diversity, so as deer destroy biodiversity among plants, the other species suffer losses as well.

These statistics indicate that deer are out of balance in our woodlands and are taking more than their ecological "fair share" of the resources at the expense of biological diversity. Approximately one major independent study each year between 1983 and 1990 showed that deer density of less than 15 per square mile is necessary for successful natural regeneration or human-initiated restoration of vegetation. Wooded habitats with very high deer density decline to stands of older trees with no wildflowers, shrubs or saplings. This type of damage has begun at the Missouri Botanical Garden's own Shaw Arboretum in Gray Summit, where staff and volunteers are monitoring the area so that measures can be taken when necessary to prevent more serious damage.

— James C. Trager, Ph.D.
Arboretum Naturalist

***Alwyn Gentry Remembered** — Friends and staff of the Garden gathered in the Climatron on the afternoon of August 3, 1994, to dedicate a plaque in memory of Garden curator Alwyn H. Gentry. Dr. Gentry, the world's foremost expert on the plants of Latin America, and three others were killed on August 3, 1993, in a plane crash near Guayquil, Ecuador while doing an aerial survey of the forest. Those attending included Gentry's wife Rosa del Carmen Ortiz-Gentry, his son Darrell Gentry and his daughter Diane Gentry, shown in the lower right of the photograph below. Dr. Nancy R. Morin, assistant director, and Dr. Oliver Phillips, one of Gentry's students, addressed the group. The plaque reads, "In loving memory of Alwyn H. Gentry, 1945–1993. Renowned botanist, ecologist, conservationist, and teacher. Your inexhaustible spirit and passion for tropical forests will inspire us forever."*

CLIFF WILLIS

CLIFF WILLIS

***Howard Hughes Program Trains Teachers and Students** — Last year the Garden was one of only 22 science museums to receive grants from the Howard Hughes Medical Institute for training elementary science teachers. This summer the first group of ten teachers worked with Garden education staff to teach summer science programs for children from St. Louis city schools (shown above), utilizing the new strategies and concepts the teachers have learned in the training program. Both students and teachers benefitted from the summer classes, and this fall the teachers will return to their classrooms with new knowledge and skills to enrich their teaching.*

Galapagos Workshop Trains Teachers

From July 8 to 18, 15 elementary teachers from Missouri walked among the sea lions, blue-footed boobies, waved albatrosses, marine iguanas, and unusual plants of the Galapagos Islands. The group studied the unique ecological relationships between the plants and animals of this exciting island system. Along with the Garden, the workshop was co-sponsored by the University of Missouri-Kansas City and funded by the Missouri Coordinating Board for Higher Education.

The participating teachers were chosen from over 122 applicants from throughout Missouri. Those selected have demonstrated past leadership in teaching science at the elementary level. Five teachers from the St. Louis area participated, including Gloria Foster, St. Louis; Richard Grommet, Ferguson-Florissant; Lynn Smith, Sullivan; Lynn Tripoli, University City; and Nancy D'Arcy, a St. Louis Public School District teacher assigned to the Garden.

The program started on June 27 and 28 with a two-day ecology workshop held at the Garden. After their trip, the group met on August 8 and 9 in Kansas City to develop curriculum materials to help teach ecology to their students. In addition to their memories, the teachers returned home with a new level of understanding of ecology and many new ideas that will be used in their classrooms. The thousands of children the teachers have in their classes in the future will be the real winners from this program.

— Larry DeBuhr Ph.D., Director of Education

Missouri teachers board a boat on Genovesa Island to return to their ship after a morning nature hike.

Exploring Trinidad and Tobago

In July sixteen teachers and other adventurers joined ECO-ACT coordinator Barbara Addelson and me on an adventure to Trinidad and Tobago, the southernmost Caribbean islands just six miles off the coast of Venezuela. For nine days we explored unspoiled tropical habitats, from mountain rain forests to savannahs, salt water swamps, beaches and coral reefs.

From our idyllic location at the Asa Wright Nature Centre, nestled in the mountains of the Northern Range of Trinidad, we spent four days exploringing this former coffee-cocoa-citrus plantation. We had spectacular views of blue-crowned motmots perched in huge bamboo thickets and an array of blooming epiphytes clinging to tree branches, with the raucous cries of parrots flying overhead. Excursions included a late afternoon boat ride through the mangroves of Caroni Swamp, where we saw a breathtaking flight of scarlet ibis returning to their mangrove roosts at dusk. On a late night excursion to an isolated beach, we encountered a magnificent leatherback turtle in the process of laying her eggs.

On Tobago, we enjoyed treks through beautiful rain forests and explored the incredible underwater world of the coral reefs in the tropical blue waters. Strolls on the beaches, walks through a nearby town, and an evening with a local calypso group were other delights of Tobago. We all brought home a better understanding of the complexity of tropical ecosystems and enjoyable memories of the people who live there. *–Lydia Toth, Shaw Arboretum*

Right: Lalaja Trace, overlooking the rain forest of the northern mountains of Trinidad.

The Garden Partner

"CD-ROM" is the hottest thing in computers today. The Garden is teaming up with Ruess + Ruess, a St. Louis marketing and communications company, to produce an innovative series of CD-ROM discs called *The Garden Partner*. Each stores an entire book, with full-color photos and audio, on a 3-1/2" compact disc that can be played back on your computer screen. "ROM", which stands for "read-only memory", means that you cannot record on the disc, you can only read it, as you would a book.

But what a book! With a simple click of a button you can find pictures of specific plants and and information on how to care for them, whether you're a Master Gardener or a weekend weed warrior. Powerful search capabilities make it easy to find plants that suit your tastes, even if you can't tell a dandelion from a daisy. A resource section provides gardening tips, sources for garden materials, and a bibliography of publications. The program customizes the information according to your particular gardening conditions, providing "smart" answers to your questions, and a "notebook" function lets you collect, store and print the information you find. And it's fun! How many gardening books tell you how to pronounce "impatiens" or let you hear a clap of thunder when you read about watering the lawn?

Ruess + Ruess, who are designing the new exhibits for the Brookings Interpretive Center at the Garden, are developing *The Garden Partner* in cooperation with Garden staff. The first Garden Partner will feature Perennials. A series is planned, to include such topics as Annuals, Bulbs, Roses, Trees and Groundcovers.

The first *Garden Partner* is due out in time for the holidays. Watch future issues of the *Bulletin* for more details.

TRUSTEE PROFILE

Mrs. Raymond Wittcoff

ROMA WITTCOFF was named an Emeritus Trustee by the Garden's Board in January, 1994. A native St. Louisan, Mrs. Wittcoff and her husband, Ray, share a deep commitment to the cultural activities of the St. Louis area.

Mrs. Wittcoff has served as a trustee of Washington University for the past ten years; her husband also serves on the Washington University board. Through the years Mrs. Wittcoff has been involved with a number of St. Louis organizations, including the executive committee of St. Louis Opera Theatre and the boards of the St. Louis Symphony and KETC-Channel 9.

Mrs. Wittcoff's involvement with the Garden began as a volunteer in the bryology herbarium, where she assisted senior botanist Dr. Marshall R. Crosby with mounting and filing moss specimens. As she gained knowledge about the Garden and its mission, she began taking classes in horticulture through the Garden's adult education program and developed an abiding appreciation of the pleasures and beauty of gardening.

"Dr. Raven has brought international recognition to St. Louis on a horticultural and scientific level," Mrs. Wittcoff said. "The Garden's growth, under the direction of Dr. Raven, has been phenomenal, and today the Garden is one of the greatest assets of our city."

In welcoming Mrs. Wittcoff to the Board of Trustees, Dr. Raven said, "We are delighted to have our longtime friend Roma Wittcoff as a member of our Board. Her friendship and support have meant a great deal to the growth of our research program over the years, and we look forward to continuing to work with her."

Darman J. Williams, a 16-year veteran of the horticulture staff, stands in the Bakewell Court at the west end of the Linnean House. Darman has maintained the elegant topiary shown in the background ever since it was planted in 1982, when the shaped junipers had less than half their current volume. The Bakewell Court was a gift of Mr. and Mrs. Edward L. Bakewell, Jr.

Clinton Names Raven and Weldon to Presidential Advisory Committee

THE WHITE HOUSE announced on August 3, 1994, that Peter H. Raven, Ph.D., director of the Garden, and Virginia V. Weldon, M.D., senior vice president of public policy for Monsanto Company, have been appointed to serve on the President's Committee of Advisors on Science and Technology (PCAST). President Clinton appointed 18 distinguished individuals from industry, education, research institutions, and nongovernment organizations to serve on PCAST. This presitigious committee is the highest level, private sector advisory group guiding the President on science and technology matters.

"I am honored to be selected as part of this committee organized to advise the President of the United States on vital national science issues," said Dr. Raven. "Science, technology, and the environment will play the dominant role affecting American economy, security, and quality of life in this decade. The actions we take as a nation — or fail to take — in the next few years will have long lasting, serious impact on America and the world in the next century."

President Clinton established PCAST in November 1993. The group will advise the President directly and also will counsel the National Science and Technology Council (NSTC). PCAST will offer feedback about federal programs and actively advise the NSTC about science and technology issues of broad national importance.

"I am very pleased to name these eminent scientists, engineers, business leader, and educators as some of my key advisors," the President said. "Drawn from a cross-section of America, they will help ensure that our science and technology policies reflect our nation's needs: health; prosperity based on long-term economic growth and technological investment; national security; environmental responsibility; and improved quality of life."

Raven Among First Westerners Elected to Chinese Academy of Sciences

FOR THE FIRST TIME in its history, the Chinese Academy of Sciences, the most prestigious scientific body in China, has elected foreign members. The 14 scientists, elected on June 8, 1994, represent the United States and the United Kingdom. The list includes Dr. Peter H. Raven, director of the Garden, together with ten Chinese scientists living abroad and three other non-Chinese.

Among the 14 newly elected members, five are Nobel laureates. All the scientists were elected because of their scientific accomplishments in their own fields of study and their significant contributions scientific development in China. Dr. Raven, the only biologist in the group, was cited for his research in pollination biology, co-evolution between insects and plants, conservation biology, and his publication of more than 500 research articles and 17 books in systematic botany. He was particularly noted for his leadership in the preservation of biodiversity, conservation of natural resources, and protection of the ecosystems of the world.

Dr. Raven was born in Shanghai, China, in 1936, and grew up in San Francisco. In 1978, as president of the Botanical Society of America, Dr. Raven appointed the first botanical delegation to visit China, beginning a program of interchange that eventually led to the concept of producing an English-language account of the plants of China. The landmark *Flora of China* program is headquartered at the Missouri Botanical Garden.

SENATORS HONOR RAVEN — On June 10, 1994, Senators John D. Schneider, Wayne Goode, and John E. Scott presented a resolution of the Missouri State Senate to Dr. Peter H. Raven, director of the Garden. The resolution honored Dr. Raven for bringing international recognition to St. Louis and for his "pioneering efforts in documenting the richness and diversity of life on this planet for the benefit of future generations." Shown presenting the resolution are (from left) Senator and Mrs. Goode, Peter Raven, and Mrs. Schneider. Senator Schneider, Senator Scott and Mrs. Scott were unable to attend.

Hewlett Foundation Supports FNA

THE William and Flora Hewlett Foundation has authorized a one-year grant of $50,000 to the Garden for support of the *Flora of North America* program. David Pierpont Gardner, president of the foundation, said, "The *Flora of North America* is a substantial and important scientific endeavor. We make this award because of the inherent significance of the project and the high regard we hold for Dr. Raven and his colleagues at the Garden."

Flora of North America is a collaborative effort to produce the first comprehensive flora and associated database of all plants growing naturally in the United States, Canada, and Greenland. This enormous undertaking is being assembled by hundreds of plant scientists, with the Garden serving as administrative headquarters. The project has wide applications for use by scientists, educators, conservationists, land use planners, and others.

Dr. Peter H. Raven said, "The Hewlett Foundation's grant will help a great deal in the continuation of the *Flora of North America* project, which is of such fundamental importance. We deeply appreciate their support."

In Memoriam *Roberto Burle Marx*

STAFF AND MEMBERS of the Garden were saddened by the death of Roberto Burle Marx, the distinguished Brazilian landscape architect and ecologist who received the Garden's Greensfelder Medal in 1983. Mr. Marx died in Rio de Janeiro on June 4, 1994. He was 84.

Mr. Marx, long recognized as one of the world's greatest landscape designers, was also celebrated as a painter and botanist. He designed the landscaping for Brasilia, Brazil, and designed the largest public park in Venezuela as well as public and private gardens in South America and Europe. He was committed to the preservation of the flora of his native Brazil and financed several botanical expeditions.

In addition to the 1983 Albert P. and Blanche Y. Greensfelder Medal from the Garden and many other prestigious awards, Mr. Marx received the 1985 Medal Award from the American Society of Landscape Architects. The ASLA award stated, "Few individuals have equalled his stature as a 20th century Renaissance man with the design profession."

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Inside This Issue

3.
EMPEROR & EMPRESS OF JAPAN VISIT THE GARDEN
Emperor Akihito and Empress Michiko planted a tree in Seiwa-En.

5.
FIRST LOOK AT THE NEW BUILDING
The Partnership Campaign moves into its second phase.

6.
THE HERITAGE SOCIETY
Including the Garden in your estate planning can benefit you, too.

9.
VOLUNTEER EVENING
We salute our wonderful volunteers and honor their special achievements.

10.
EWANS RECEIVE SHAW MEDAL
Joseph and Nesta Ewan will be honored with the Henry Shaw Medal in October.

11.
FRESH FROM THE GARDEN
A new line of foods from Ces & Judy bring home a taste of the Garden.

12.
CALENDAR OF EVENTS
Fall Flower Show Preview, and more.

18.
NEW EDUCATION FACILITY NAMED
The new E. Desmond and Mary Ann Lee Family Education Center.

20.
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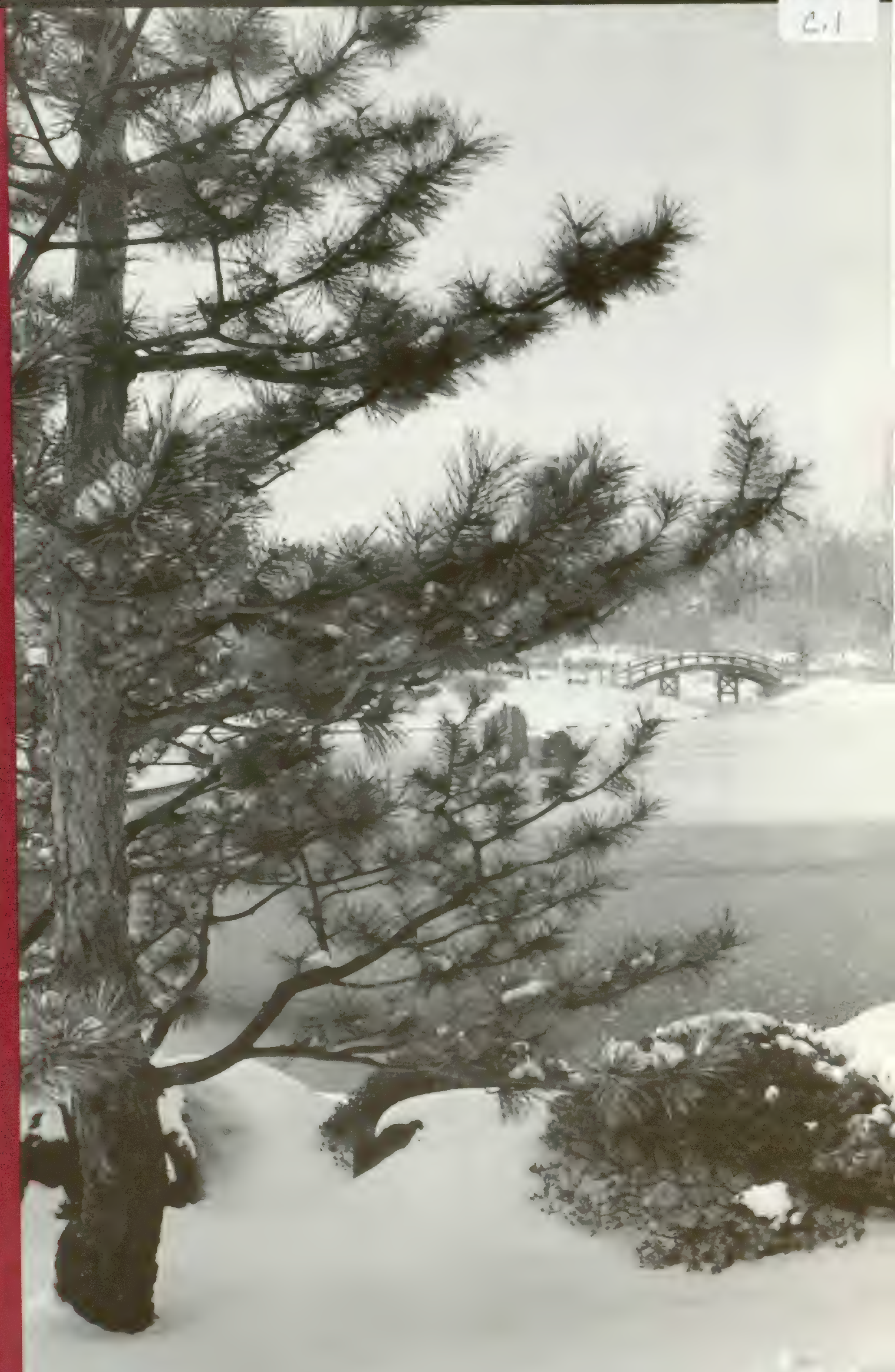

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Comment

MISSOURI BOTANICAL GARDEN MISSION: "TO DISCOVER AND SHARE KNOWLEDGE ABOUT PLANTS AND THEIR ENVIRONMENT, IN ORDER TO PRESERVE AND ENRICH LIFE."

This issue of the *Bulletin* is filled with activities and events as we approach the holiday season. But perhaps the most important story is "A Season for All Things" on page 9. Your response to the Henry Shaw Year-End Appeal is crucial for balancing the Garden's operating budget, especially as we are continually challenged to deliver the highest level of service in the face of limited resources, including static tax support. If the Garden is to remain a leader in environmental education, scientific research, and community service, we must ask each of you to help. As members, your support is the cornerstone of the Garden's achievements. I hope you will be able to respond generously and take pride in helping to maintain this outstanding institution.

The Partnership Campaign continues to make progress toward its goals. We are delighted to announce that the new research building has received federal support (see page 6), which will help to place St. Louis at the forefront of the new biotechnology industry. The demonstration gardens at the William T. Kemper Center for Home Gardening are beginning to take shape, and I encourage you to take a look at the story on page 5, then walk by the construction site soon to see the exciting developments for yourselves. At this writing, only a few of the individual gardens remain available for naming gifts.

I take great personal satisfaction in announcing to our members the arrival of Volume 17 of the *Flora of China*, the first volume to be published (page 7). This extraordinary international accomplishment is the fruit of years of work by scores of dedicated scientists, and we look forward eagerly to subsequent volumes.

Please enjoy all of the holiday activities here at the Garden! It is our way of celebrating and thanking each of our members for your splendid support.

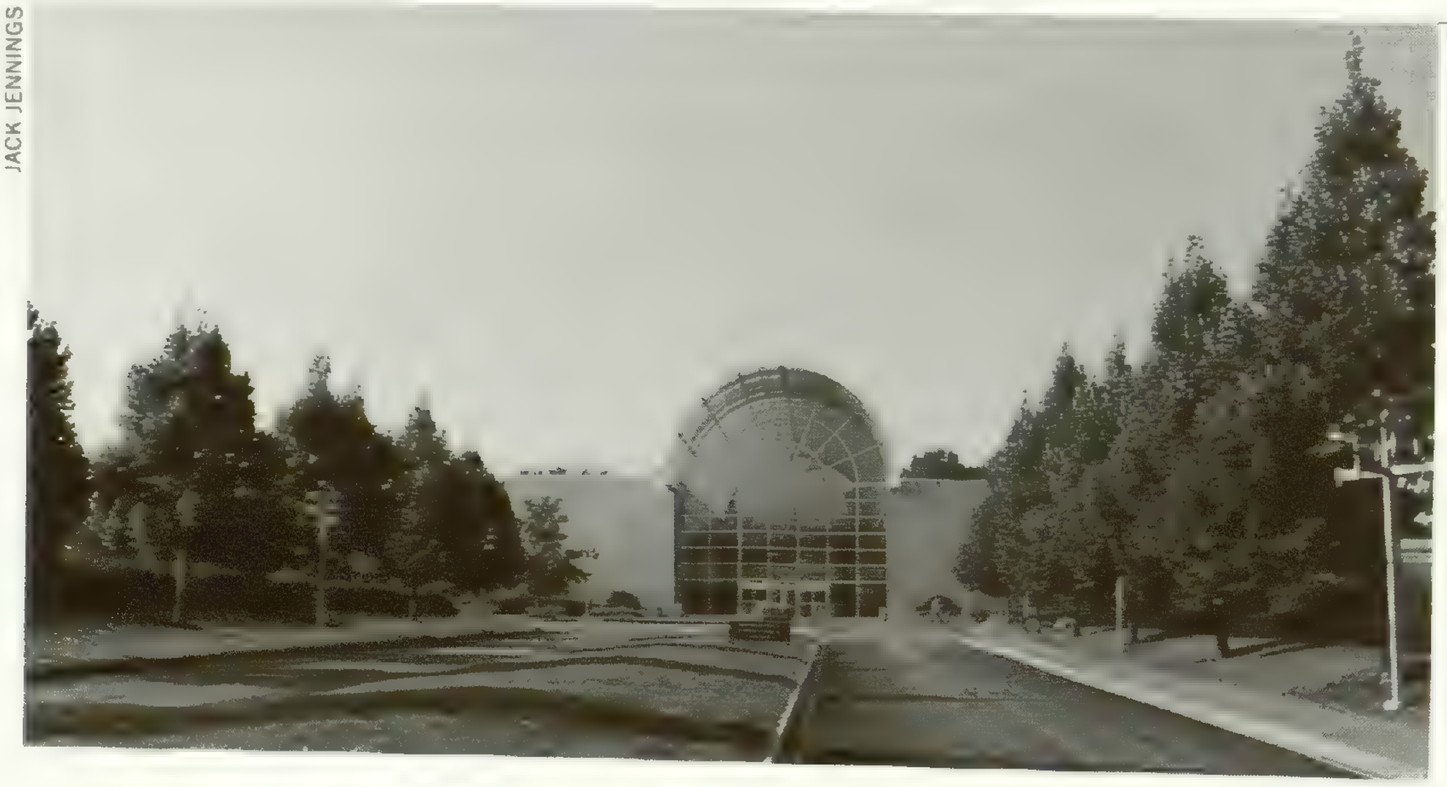
— Peter H. Raven, Director

Moving?
Please remember to send us your new address.

To avoid missing any of your membership mailings, we need notification of your new address at least three weeks before you move. Please enclose the mailing label on the back cover of this *Bulletin* and mail to:

Name:_____
Old Address:
Street_____
City_____
State_____ Zip_____
New Address:
Date effective:_____
Street_____
City_____
State_____ Zip_____

JACK JENNINGS



Have You Noticed — *Tilia americana* 'Redmond'

As you drive into the Garden, you will notice the beautiful allée of linden trees that lines the entrance. These lovely trees are a cultivated variety of American basswood, *Tilia americana*. This particular variety, 'Redmond', was discovered in the early 1920s on the property of C. M. Redmond, a nurseryman in Fremont, Nebraska, and was introduced to the public in 1927. The 'Redmond' linden is a handsome tree, valued for its dense, pyramidal shape and fragrant spring blossoms, which can be used to make a flavorful tea. The pea-sized fruits disperse seeds by dropping to the ground in a unique, twirling, "helicopter" system. This popular landscape tree is often used for shade and ornament along streets and in lawns. The scientific name for the linden came to us in the 18th century from Carl Linneaus, the father of plant classification. Linneaus' father took their family name, Linné, from the tall linden tree that grew near their village in Sweden. One or both rows of the Garden's beautiful linden trees are available as naming gifts. Please call the Development Office at 577-5120 for information on endowing trees or other features at the Garden.

On the Cover

The lake in Seiwa-En is beautiful in the snow.

Photo by King Schoenfeld

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Shoenberg

Administration Building Is Dedicated

FRIENDS, TRUSTEES, AND STAFF OF THE GARDEN gathered on the late afternoon of September 28, 1994, to dedicate the Shoenberg Administration Building, named to celebrate the longstanding commitment and generosity of the Shoenberg Foundation, Inc. to the Garden. In the next few years this historic building will be renovated to preserve the townhouse of the Garden's founder, Henry Shaw, and expand critically needed administrative office space.

The north end of the Administration Building originally stood at Seventh and Locust streets in downtown St. Louis. Built in 1849, it was designed by George I. Barnett, who also served as architect for Tower Grove House. Under the terms of Shaw's will, the townhouse was moved to the Garden in 1891. In 1909 the south wing was added to house the herbarium, library, and classrooms, which are now located in the John S. Lehmann Building and the Ridgway Center.

Gifts from the Shoenberg Family and Foundation have enhanced the Garden throughout the past decades. Visitors delight in the beauty of the two Shoenberg Fountains and the bust of Linnaeus and enjoy performances in the Shoenberg Auditorium. Future generations will benefit from rare and valuable books preserved in the Shoenberg Conservation Center. And the magnificent Shoenberg Temperate House houses the Garden's outstanding collection of plants native to warm, Mediterranean climates.

Speaking at the dedication, Dr. Peter H. Raven said, "The culture of our community owes more than we can imagine to the continuing friendship of Eleanor, Jean, Robert, and Sydney Shoenberg, as well as to the late Jimmie and John Shoenberg. Theirs is a tradition of philanthropy and civic spirit handed down with great care to younger generations of the family. The list of their gifts to the Garden can only hint at the joy, the knowledge, and the satisfaction experienced by millions of visitors who have benefitted from them through the years."

Above: Shown at the dedication are family members (seated, from left): Nora Stern, Robin Zwick, and Jean Shoenberg. Standing, from left: Walter Stern, Sydney Shoenberg, Robert Shoenberg, and Stephen Zwick.

MISSOURI BOTANICAL
NOV 10 1994
GARDEN LIBRARY

A GIFT from the Spoehrer Family Charitable Trust will provide funding for the construction of the Children's Garden — one of the new demonstration gardens in the William T. Kemper Center for Home Gardening.

Children's Garden

The Children's Garden is being given in memory of the late Mr. and Mrs. Hermann F. Spoehrer, whose estate established the trust.

Mr. and Mrs. Spoehrer were great friends of the Garden and, by virtue of their extraordinary philanthropic efforts, of the entire St. Louis community. Harriet Spoehrer was a member of the Garden for more than 25 years and served on the Garden's Board of Trustees from 1985 until her death in 1992. Hermann Spoehrer was an engineer and co-founder of two highly successful business enterprises, S & S Electric Company (forerunner of Sachs Electric Co.), and The Sporlan Valve Company.

Mrs. Spoehrer's generous nature led her to make substantial contributions to her community through Washington University, the Missouri Botanical Garden, Children's Hospital, Central Institute for the Deaf, Junior Achievement, the Salvation Army, Paraquad, Rainbow Village, a number of area schools, and many other service institutions. Observed Peter Raven, "Harriet and Hermann Spoehrer were extraordinarily kind and loving people, devoted to their family and, as a result, keenly interested in the general welfare of families and children. This naturally inspired gifts that would be appreciated by families throughout the entire community for generations, including: endowed scholarships at Washington University, the Spoehrer Tower at Children's Hospital, and so many others that it would be impossible to list them all here. Her own support for our work has enabled us to add the gracious Spoehrer Plaza, the first garden space encountered from the Ridgway Center; the renovation of the Climatron into a magnificent teaching tool on tropical ecology; and numerous programs and services in education and research. Their legacy of love and good works will sustain the Garden and all St. Louis for decades to come, and I cannot think of a more appropriate memorial to Harriet and Hermann Spoehrer than our wonderful Children's Garden."

The Children's Garden is designed to be fun and educational for children visiting with their families or school classes. It begins with a herringbone brick-paved path and, centrally located within the Kemper Center for Home Gardening, it promises to be a whirlwind of activities. At the center of the garden is a small maze, punctuated with topiary animals, winding around to a topiary house at its center. Inside the house is a surprise, a peacock fountain featuring two cast bronze peacocks with tails spraying a fan of water in which children may play. Around the perimeter are borders containing storybook and nursery-rhyme plants. Children will find fat fuschia buds, obedient plant, mouse plant, bleeding hearts, policemen's helmet, and touch-me-nots.

Mixed in with the fun activities will be an educational center with room for 25 children. The children will visit five learning stations on plant structure, seed pollination, plant texture, plant scent, and a grow-your-own bed. They will also learn about unusual plants, such as colored corn, gourds, and sunflowers.

The Spoehrer's daughter, Mrs. Robert P. Tschudy, is enthusiastic about the project. She said, "My parents would have been enchanted with this wonderful garden and its meaning for the many thousands of youngsters who will visit it each year. When I learned of it, I knew it was such an appropriate way to carry on the spirit of giving they shared."

Left: The circular walk is in place for the Secret Garden behind the Kemper Center. The foundations of the Backyard Garden are visible in the background, and a new maintenance building is going up to the right.

Below: A workman positions a gable for the new maintenance building.

New Gardens Take Shape

Above: Raised brick planting beds outline the area where the Garden For All will bloom to the south of the Kemper Center.

Right: Foundations for the walls of the Boxwood Garden enclose a large oval area just to the north of the English Woodland Garden.

United States Department of Agriculture Supports New Research Building

THE GARDEN'S NEW RESEARCH CENTER, the major component of the Partnership Campaign, received support from Congress this fall through the U.S. Department of Agriculture. A total of $757,000 was approved by the House and Senate to help fund the construction of the new building.

"The growing biotechnology industry means new, good-paying jobs in St. Louis," said Congressman Richard A. Gephardt. "We must continue to secure federal support to assist in efforts such as the Missouri Botanical Garden is undertaking to expand this growing and critical industry in our region."

The Garden is already collaborating on research projects with the National Cancer Institute, Monsanto Company and others. The new research building, to be located at the southwest corner of Shaw and Vandeventer, will make the Garden's world class herbarium and library easily accessible to corporate, government and university researchers and will assist them with the development of biotechnology products.

"This is an investment in the future of St. Louis, our state and our nation," said Senator Christopher S. Bond. "The type of research work being conducted by the Garden enriches life to the great benefit of all. Having and holding on to international leadership in biotechnology will determine the strength and vitality of this nation in years to come."

Representative Richard J. Durbin of Illinois, who serves as chairman of the appropriations subcommittee on agriculture, said, "Knowing the Missouri Botanical Garden will be in the forefront of biotechnology leadership by providing and expanding basic information about plants means even more opportunities for our bi-state region. This investment is essential for making better jobs and a better world to live in."

"People are the key element," said Congressman William L. Clay. "People make the difference. This project takes the best from the plant world and makes the best for people. The staff and volunteers of the Missouri Botanical Garden reach and teach so many that this investment returns big dividends in both the short-term and the long run for all of St. Louis."

According to Peter H. Raven, director, "Modern biotechnology, which is still in its infancy, has brought us to the edge of expanded understanding that holds promise for using plants for new agricultural products and new treatments for disease, and this building will place the Garden's program in the forefront."

"This is an investment in the future of St. Louis, our state, and our nation. The type of research being conducted by the Garden enriches life to the great benefit of all. Having and holding on to international leadership in biotechnology will determine the strength and vitality of this nation for years to come."

— Senator Christopher S. Bond

"The growing biotechnology industry means new, good-paying jobs in St. Louis."

—Congressman Richard A. Gephardt

NEWS FROM THE CENTER FOR PLANT CONSERVATON

Anukriti Sud

New Manager of Conservation Programs

MS. ANUKRITI SUD has joined the Center for Plant Conservation as manager of Conservation Programs. The Center for Plant Conservation (CPC) is a national non-profit conservation organization headquartered at the Garden. Ms. Sud comes to CPC from Wade Miller Associates, Inc., Washington, D.C., where she worked as an environmental analyst.

The manager of conservation programs at CPC is responsible for the National Network of Participating Institutions, supervises the National Collection of Endangered Plants, manages the Priority Regions Program and the Center's Integrated Conservation Program.

Ms. Sud has worked with the World Resources Institute and Greenpeace International, two internationally recognized non-profit conservation organizations. Her experience has focused on environmental policy with emphasis on tropical forestry issues. She holds two graduate degrees, a Master's in Forestry from Duke University and a Master's in International Affairs from Columbia University in New York.

PLANT NAMED FOR RAVEN IN SHOENBERG TEMPERATE HOUSE
A specimen of the extremely rare Presidio Manzanita, *Arctostaphylos hookeri* G. Don subsp. *ravenii* P. Wells, a member of the Ericaceae or Heath family, was planted this summer in the Shoenberg Temperate House. Horticulturist June Hutson, curator of the Temperate House, is shown here with the low-growing plant. The single surviving plant of this subspecies was discovered by the Garden's director Peter Raven in 1951, when he was a 15-year old high school student, and it was later named in his honor. It grows on serpentine soil outcrops in the Presidio in San Francisco, overlooking the Golden Gate.

Flora of China Publishes First Volume

ABOVE: CELEBRATION IN CHINA — Peter H. Raven presented a copy of the first published volume of the *Flora of China* to Jiang Zhe-min, president of the People's Republic of China (left), following a September meeting of the National Natural Science Foundation of China in Beijing. At the meeting, which considered strategic planning for science in China for the next five years, Raven gave a presentation on priorities in biology.

AT LEFT: In recognition of the publication of the first volume of the *Flora of China*, the Garden honored Dr. William Tai (left), curator and codirector of the project, and Dr. Ihsan Al-Shehbaz (right), associate curator and editor-in-chief of the *Flora of China*. Dr. Raven (center) paid tribute to the two botanists and their achievement during a Garden staff meeting in August and presented each of them with a framed picture. Dr. Tai's picture is a woodblock print of the white mustard, *Sinapi secundum* or *Sinapis alba*, from an original block of the 1562 edition of Mattioli's herbal. Dr. Al-Shehbaz's picture is a contemporary watercolor depicting Chinese wild mustard, *Orychophragmus violaceus*.

THE FIRST VOLUME of the *Flora of China*, an English-language update of the Chinese-language description of the plants of China, has been published jointly by the Missouri Botanical Garden and Science Press in Beijing. Its publication was announced in Beijing on August 1, 1994. Twenty-five English-language volumes will be produced over the next 15 years. The first volume published, Volume 17, covers 1,090 species in three families, including the Solanaceae, a family containing potatoes, tomatoes, peppers, eggplants and tobacco.

The *Flora of China* project is a joint Sino-American effort to revise, condense, and publish for the first time into English the masive Chinese-language *Florae Republicae Popularis Sinicae* (FRPS), an 80-volume, 124-book catalog of plants growing in China. "China's plants are extremely important and there is a great deal to be gained from expanded knowledge about them," said Peter H. Raven, director of the Garden. Raven, co-chair of the Flora of China project with Wu Zheng-yi, Director Emeritus of the Kunming Institute of Botany and editor-in-chief of FRPS, helped to conceive the project in the late 1970s. Historically, access to information about the plants of China has been limited by political and language barriers. The English revision of the Flora will allow botanists all over the world to study the botanical treasures of China, a breakthrough for international scientific research.

In addition to the printed volumes, all the data on the Chinese plants will be included in the Garden's botanical database, TROPICOS. The date will be accessible throughout the world on the Internet, as well as through hard copies, tapes, and diskettes. Botanical data is used by botanists, land managers, foresters, biologists, and conservation and environmental monitoring groups.

There are about 30,000 plant species native to China, as compared to 17,000 in North America north of Mexico. Many of these plants are of extreme economic importance and are now cultivated around the world. These include short-grain rice, tea, soybeans, oranges, cucumber, lemons, peaches, ginger and ginseng. In addition, nearly 5,000 species of plants are used for medicine in China today, a fact of increasing interest to western medical researchers and pharmaceutical companies. Two-thirds of the people of China use plants directly as sources of medicine. China also has more than 7,000 species of plants of horticultural importance, including rhododendron, azalea, magnolia, camellia, viburnum, gardenia, primrose, gentian and forsythia.

The *Flora of China* project is a collaborative program of the Missouri Botanical Garden, Harvard University, the Smithsonian Institution, the California Academy of Sciences, the Royal Botanic Garden, Edinburgh, and the Botanical Institutes of Beijing, Guangzhou, Kunming and Nanjing. The Garden and the Institute of Botany, Beijing, serve as the coordinating headquarters. Editorial and data processing centers have been established at each of the cooperating botanical institutes in China. The project has advisors in Europe, Russia and Japan.

YOU & THE

ENVIRONMENT

EarthWays Home Garden

A team of volunteers from the Garden is collaborating with EarthWays to landscape a city garden at the EarthWays Home, an environmental learning center located at 3617 Grandel Square, in the heart of the Grand Center Arts and Entertainment District.

All of the plantings were grown from seed collected from native plants at the Garden's Shaw Arboretum. Native species offer several advantages for urban gardeners, including low maintenance and winter hardiness. The landscaping at the EarthWays Home was planned to illustrate all of the environmental benefits of a home garden: water and energy conservation, preventing erosion, attracting birds and wildlife, techniques for raising fruits, vegetables, and flowers in an urban environment, and recycling yard waste by composting. "The EarthWays Home is a wonderful facility for demonstrating all kinds of strategies for living in tune with the environment," said Dr. Steven D. Cline, manager of the Kemper Center for Home Gardening. "The landscaping showcases many of the concepts and techniques we encourage at the Garden, in a way city dwellers can see and understand.

Steve Cline (right) and Katie Belisle of the Kemper Center for Home Gardening, together with a team of Master Gardeners, planted a native wildflower garden at the EarthWays Home in September.

We look forward to continuing to work with EarthWays to educate people about environmentally sound choices for home gardening." Initial funding for the planting phase of the EarthWays Home Garden was provided by Union Electric's Greenleaf Foundation, with in-kind support from Hellmuth, Obata & Kassabaum, Inc., Washington University School of Architecture, and Landscaping Architecture Resources.

Garden Coalition's Neighborhood Greening Program Will Help the City Bloom

THE ST. LOUIS COMMUNITY FOUNDATION has awarded the Urban Gardening Partnership — a coalition made up of the Missouri Botanical Garden, University Extension and Gateway to Gardening — a two-year grant in the amount of $15,000 to develop a comprehensive greening plan for low- to moderate-income sections of St. Louis, sparking community revitalization. The grant from the F. William Weinheimer Fund will support in part the Urban Gardening Partnership's plan to implement the following projects:

Community Lotscapes — Community gardens will be developed on vacant lots to include flowers, trees, shrubs and vegetable gardens.

Street Tree Blocks — Street trees will be planted on boulevards and public parks.

Garden Blocks — Sidewalk container flower gardens will be supplied in business and residential areas.

Initially, five neighborhood groups will be targeted. Plans might include landscaping projects in common areas, pocket park development, improving neighborhood entrance areas, planting street trees, establishing community gardens and comprehensive community beautification. Each group also will be provided with technical information about general garden care, landscaping principles, planting, and maintenance.

The Neighborhood Greening Program will be managed through the Urban Gardening Partnership with the assistance and consultation of an advisory board consisting of 30 organizations involved in horticulture or community redevelopment.

Update — Recyling at MBG

A YEAR AGO we reported that the Garden had implemented a new recycling program of significantly broader scope. The program has seen real success in many areas yet still has much to accomplish. The difficulties the Garden has experienced are typical of those encountered by any institution or family learning to incorporate recycling into the daily routine.

continued on next page

RECYCLING UPDATE – continued

Among our achievements, in eleven months the Garden has recycled 8 tons of clear and colored glass, 14 tons of corrugated cardboard, almost 4 tons of white ledger paper, and 3 tons of miscellaneous mixed and colored paper. We also recycled 1,389 pounds of computer paper, 47 pounds of styrofoam, and 81 pallets.

These numbers indicate that we are removing significant amounts of material from the solid waste stream going to landfills. In addition, the Garden continues to recycle vehicle batteries, scrap metal, copper and aluminum, motor oil, cleaning fluid, laser printer cartridges, and tires.

The challenges encountered concern volume and quality of material submitted for recycling. As an example, due to staff enthusiasm too many unsuitable items were being placed into the "mixed paper" containers, including food wrappers, paper towels, and booklets with plastic bindings. This requires the recycler to sort the material by hand several times before it can be processed mechanically, which is very expensive. This, together with other issues such as assuring that metal cans and plastic containers are clean in order to avoid health hazards, are good examples of problems encountered by any large organization that undertakes a major recycling program. One solution is determining better ways to inform the staff about how to prepare materials for recycling.

To make a recycling program successful, three criteria must be met. There must be a market or use for the recycled product; the process must be marginally cost effective or subsidized; and the material must be ready to be processed when it is collected. The last item is where many programs fall short.

We have made significant progress, and we have found that recycling many materials is worthwhile and feasible on an institutional scale. A year from now we plan to report even more progress.

PLANNED GIVING – THE HENRY SHAW FUND YEAR-END APPEAL

A Season for All Things

AS THE HOLIDAYS APPROACH, you know what happens. Activities escalate, time disappears, and thoughts of loved ones, lists, and errands take over. Despite our best efforts, some things slip by the wayside — postponed — to be considered later.

One of the casualties of the year-end bustle might well be charitable causes, despite the fact that the Garden and others do everything possible to capture that small bit of attention you can spare at this time of year. Another casualty of the season is the thought of the following April 15. At year end, Income Tax Day could not seem further away. Yet anything you do before December 31 that minimizes taxes will be very welcome next April.

A gift to the Garden now will help on April 15.

At the Garden, too, year-end activities escalate. However, there is a unique element in the Garden's year end pattern: an awareness of the financial state of the Garden. Our deadline is not April 15; it's December 31.

The Garden's by-laws require a balanced budget at year-end. The Henry Shaw Year-End Appeal has traditionally helped the Garden to meet this challenge. The urgency is increased by the ebb and flow of the expected and the unexpected —- expenses imposed by price increases for supplies and equipment, or the loss of traditional resources when grants are slashed by funding agencies.

We hope that when you receive your appeal for the Henry Shaw Fund you will consider how important your participation is and that you will respond at the greatest level you can. While our Top Ten contest to elicit reasons to give to the year-end appeal was amusing and fun (see story below), the need is real. There is a season for all things.

If you would like information on what form your gift should take to realize the greatest tax advantages, call our Gift Planning Department at 577-9532. We would be happy to talk with you at no obligation.

"Top Ten Reasons" Winners: The Envelope, Please

IN OUR LAST ISSUE we invited Garden members to send in their ideas for the "Top Ten Reasons to Support the Henry Shaw Fund Year-End Appeal." As to be expected, our members' creativity surpassed anything we could have dreamed up. The responses were so good, in fact, that we have awarded two individuals the top prize of a $500 Director's Associate membership for one year.

The Number One Reason:

"It's a Blooming Great Cause!" — Tom Villa, city resident

Serving these many years in public office, Mr. Villa says, "I came to realize what an educational and cultural jewel the Garden is, and how blessed we are to have it."

The Number Two Reason:

"You can enjoy the beauty of a world class garden while someone else does the weeding!" — Karen Ostlund, English teacher

"As an English teacher I am aware of the importance of symbols in our daily lives. The Garden has become a symbol of our ability to work with nature to enrich our lives and the lives of our children."

When You Receive Our Year-End Appeal —

There were many excellent entries, and a sampling of the cleverest appears below. We hope that all of these reasons will inspire you to respond generously when you receive your Henry Shaw Fund Year-End Appeal in the mail.

"Where else can you see a wedding and not have to dress up or bring a gift?"

Support the Garden's Year-End Appeal "because contributing will fulfill a deep-seeded need to get back to the Garden."

"Taking a first date to watch the ivy grow allows time to get to know each other."

W H HODGE

***A Peruvian boy helps to dig the oca crop,* Oxalis tuberosa.**

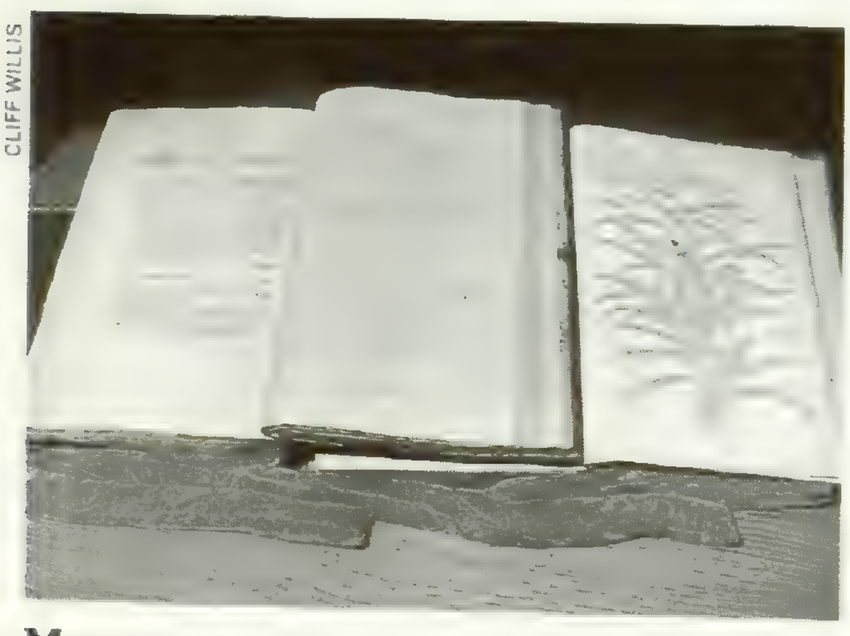
NEWS FROM THE LIBRARY

Walter Hodge Gives Photos to Archives

Walter H. Hodge, a noted economic botanist and photographer, has given his black and white negatives representing over 9,000 plants to the Garden's library. In addition, a splendid collection of 1,269 stock prints from these negatives was donated by his son, Peter H. Hodge.

The collection represents Hodge's botanical photography from 1927–1973. According to Hodge's own account, these photographs illustrate "the characteristics and economic uses of plants throughout the world. They are utilized for textbooks, encyclopedias, teaching and scientific works by the scientific community." They were also used to illustrate Dr. Hodge's own scientific papers.

Most of the negatives are by Hodge himself, but there are photos by other photographers. The largest number are by Hodge's friend, Paul Allen. A separate collection of Allen's negatives of plant photos was an earlier gift to the Garden by Walter Hodge. Inquiries about the Hodge collection may be directed to the Archivist, Missouri Botanical Garden.



CLIFF WILLIS

MASTERPIECES OF THE RARE BOOK ROOM — Published 50 years after Columbus's first voyage to the Americas, *De Historia Stirpium* is a remarkable work by the distinguished German botanist Leonhard Fuchs, for whom the genus *Fuchsia* is named. The herbal was one of the first to use illustrations renowned both for their beauty and remarkable accuracy. It introduced European readers to two plants from the New World, Indian corn and the pumpkin. The Garden library is fortunate to have two copies of Fuch's herbal, one a rare and extremely valuable hand-colored copy. Gifts from Garden members and friends are welcomed to help support the restoration and conservation of rare books such as *De Historia Stirpium*; donations can be made in honor or in memory of an individual by calling (314) 577-5177. (This article was prepared with the assistance of Hu Walsh, a library volunteer. —Editor)

Botanical Garden Magnet School Keeps Growing

THIS fall the Mullanphy Botanical Garden Investigative Learning Center welcomed nearly 600 elementary students, a big jump from the 1993 enrollment of 390. The students, grades K through 5, were greeted by renovated facilities and a brand new addition to the school featuring new science labs, a greenhouse, and a computer lab.

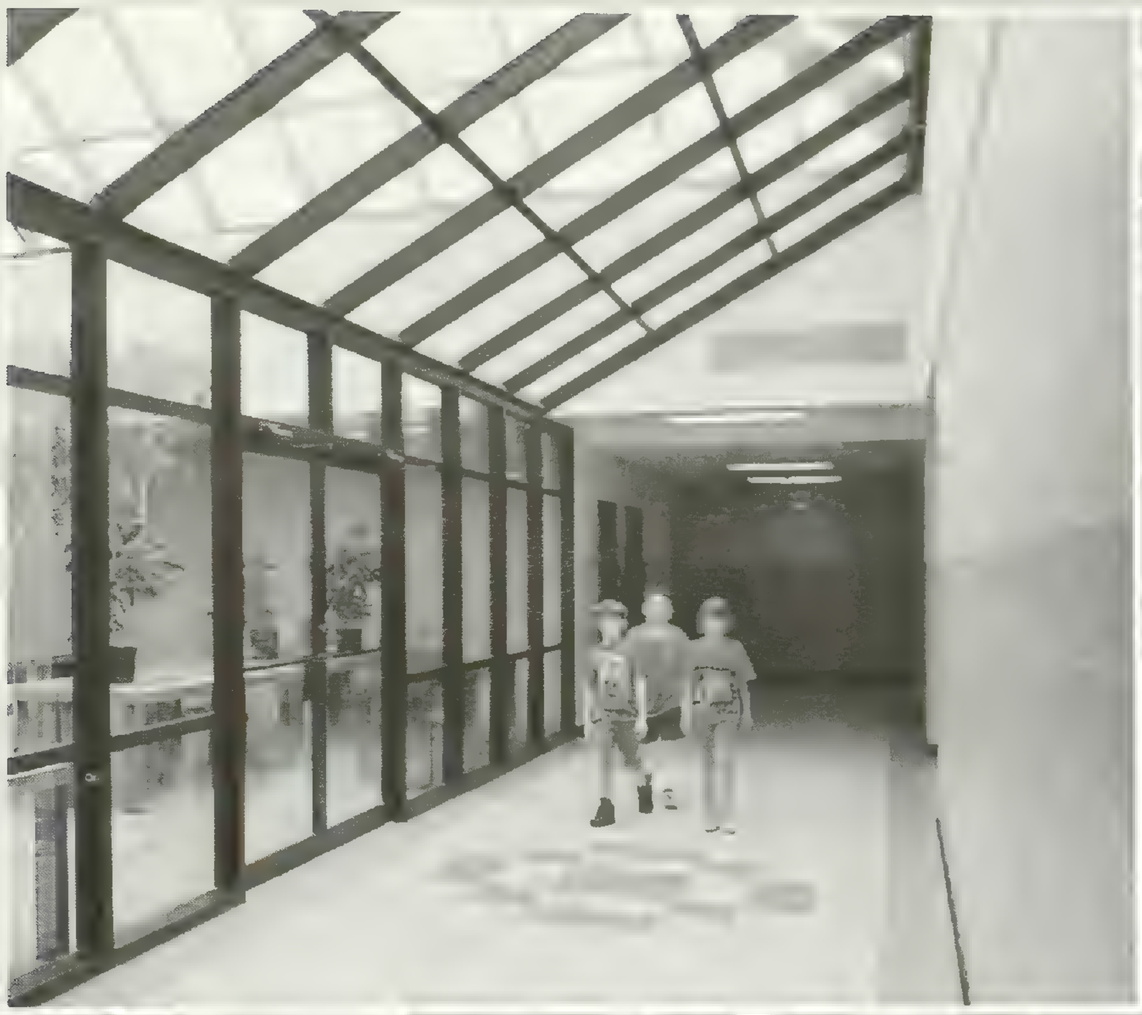
Students at the Botanical Garden ILC are encouraged to use scientific investigation and problem solving techniques in all of their classes. They are challenged with math and science plus a complete curriculum, and all classes have easy access to the living collections, displays, and other research activities at the Garden.

The Botanical Garden ILC began in 1976 as a math and science magnet school at the Stix School in the Central West End. The program has always had close ties with the Garden, and in 1993 the school moved to the newly renovated Brian Mullanphy School at 4221 Shaw Avenue, just a block from the Garden.

Alicia Ivory House, an instructor for the Garden's Education Division, teaches science classes at Mullanphy that are carefully coordinated with the school's curriculum. This year Alicia is joined by Rebecca Young, a horticulturist and education staffer at the Garden, who spends one day a week teaching students how to grow and care for plants in the school's new greenhouse.

The Garden's ECO-ACT program is active at Mullanphy this year, with students from St. Louis University High School teaching the elementary children about ecology and the environment. In addition, Glenn Kopp of the Kemper Center for Home Gardening and Master Gardener Helen Hannon will be working with three teachers and Mullanphy students to plant and restore the formal gardens in front of the school.

The Saint Louis Zoo is an important partner in the programs at Mullanphy, providing a full range of programs and activities. Students also have opportunities to participate in field trips to the St. Louis Science Center.



Above left: The new greenhouse.
Above: The computer lab.

"Observe Closely. What Do You See?"

"We will ask questions."

"We will make guesses."

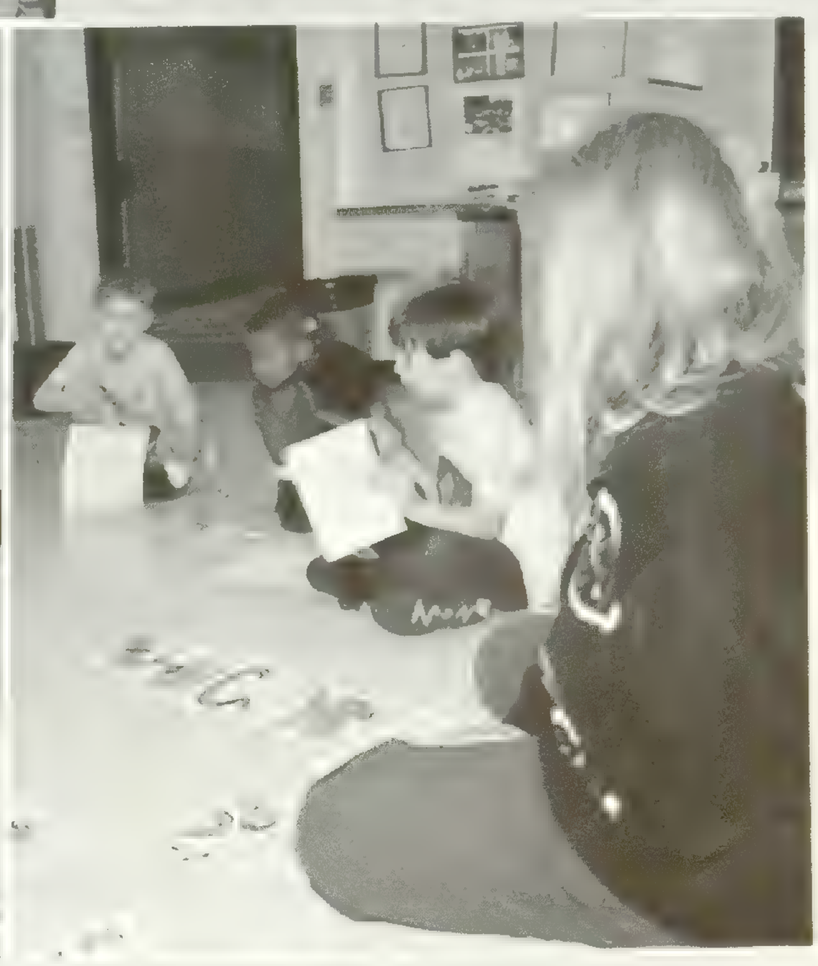
"We will experiment."

"We will record data."

"We will make conclusions."

— Signs in a science lab at Mullanphy ILC

Left: A class studies vermicomposting with earthworms
Below, left and right: Science lab



Home Gardening

A SECOND LIFE FOR YOUR HOLIDAY TREE

WHEN the holidays are over, there is always the question of how to dispose of the family Christmas tree, especially now that the issue of landfill space has become a major issue in Missouri. There are better methods than just parking the tree at the curb.

Call the Master Composter Hotline

Don't pass this up! The Garden's Master Composter Hotline (see box on next page) has lots of options, even for city dwellers who have no need for compost. There are a number of private landfills that will chip and recycle your Christmas tree for a modest "tipping fee". Call for the most up-to-date listings. Or call the HortLine (see next page) and listen to message #3706.

Of course, if you're lucky enough to have a compost pile, you can recycle your tree fairly easily. Come to the Kemper Center for Home Gardening for more information and classes in home composting. The Garden's new composting facility has a complete demonstration area with several types of home compost units.

Mulch

If you have a yard around your home, you have many possibilities for disposing of your tree. One of the simplest options is to cut off the branches and lay them over perennial beds to help protect plants from ice, snow, and freezing temperatures. The mulch also offers a refuge for small wildlife, including ground-feeding birds. In spring, remove the branches and cut them up for processing in the compost pile. Use the trimmed trunk to edge the border of a planting bed or path. NEVER burn conifer wood in your fireplace or wood stove — see "Do's and Don't's" on the next page.

If you're lucky enough to have a chipper/shredder, you can quickly transform your tree into useful chips that make splendid mulch. Layer it over your planting beds, and when you prepare the beds in springtime, work the material into the soil. If you are incorporating a layer two inches deep or more, you may need to increase the amount of fertilizer used by as much as one-half to offset the nitrogen that will be consumed during decomposition. If you don't own a chipper/shredder, you might consider purchasing one with a neighbor, or renting one. You can process all the brush left over from outdoor cleanup at the same time as your holiday tree.

Crafts Projects

If you're a craftsman, the tree trunk can be used for all kinds of projects, including candlesticks or birdhouses and feeders. The fragrant needles of balsam fir make a wonderful potpourri, or try some as a closet air freshener, stored in a paper bag.

You can also reuse your tree, at least for a while, as a bird feeder, and kids love this idea. After you remove all traces of decoration, simply place the tree in a protected area and hang suet, bird seed balls, popcorn strings, stale bread or dried fruit on the branches. Pine cones rolled in peanut butter and sprinkled with bird seed are a special treat for birds and squirrels. If you lay the tree on its side, the wildlife will appreciate the protection, too.

A Recycling Program

If you live in the country, or know someone who does, you may have been recycling your holiday trees for years as brush piles or fish habitats in ponds. You may not have access to private land, but fortunately the *St. Louis Post-Dipatch* is sponsoring a Christmas Tree Recycling Program once again this year.

In 1993 the *Post-Dispatch* collected 53,229 trees from 61 collection sites throughout the Metropolitan St. Louis area, including Jefferson, St. Clair, St. Charles, and Madison counties. At least 2,100 of the trees were dropped into lakes to serve as fish beds or used to make brush piles to shelter wildlife.

The *Post-Dispatch* program will run December 26, 1994, through January 16, 1995 (Martin Luther King Day). Watch the *Post-Dispatch* for details, and school children will see posters in their schools after mid-November.

Living Trees

Many of us love the idea of bringing a living tree indoors for our holiday celebration, then replanting it outdoors when the holidays are over. If you are buying a living tree for ecological reasons, remember that 90 percent of all cut trees today are grown in plantations. They are planted and maintained for the express purpose of producing trees for the industry, and cut trees are typically grown on land not suited for other uses, where they provide interim cover for wildlife and erosion control. For every tree harvested, two to three seedlings are planted in its place.

If you want to try a living tree, bear in mind that pines are not long-lived in the heavy clay soils so typical in St. Louis.

Pines and firs are notoriously susceptible to pests and early demise in this area. One beautiful species that seems to do fairly well here is a dwarf Colorado blue spruce, *Picea pungens* 'Fat Albert'. It reaches a maximum height at maturity of about 20', making it ideal for home landscaping.

Choosing a suitable transplanting site is crucial: it must be sunny and well drained. Digging your transplanting hole before the ground freezes and mulching the backfill to keep it from freezing will save you a lot of backbreaking labor after the holidays.

The other thing to remember about a living tree is that you cannot keep it in the house for weeks and expect it to survive. To maintain the plant in prime condition and keep the foliage from drying out, display it indoors for no more than three to five days, positioned away from heat sources and drafts.

Living trees are usually purchased "balled and burlapped", with the root system and its supporting soil bound up in burlap to keep it together. Make sure that the root ball is kept moist. Place it in a shallow pan with a small amount of water. Avoid handling the ball when it is wet, as it is likely to break apart. If the ball is frozen when you take it home, let it warm up gradually in a cool room such as an unheated garage. A drastic change of conditions will cause more problems than a gradual change in temperature and water supply. When you bring

DIRECTORY

Regional Plant Societies

The list below includes many of the plant societies that are active at the Missouri Botanical Garden. Names and telephone numbers for contact persons change frequently; please call the Kemper Center for Home Gardening at 577-9440 with changes, additions, or to obtain more information.

African Violet Council *Ardath Miller* 394-9190
Bonsai Society of Greater St. Louis *Peter Van Mier* 727-9191
Boxwood Society of the Midwest *Sheila Hoffmeister* 846-8430
Dahlia Society of Greater St. Louis *Ellis Evans* 843-3767
Daylily Society of Greater St. Louis *John Eiseman* 991-2838
East Central District Federated Garden Clubs of Missouri
Gardeners of America (formerly Men's Garden Clubs of America)(Ozark Region) *Russell McClellan* 837-2470
Gateway Chapter of the North AmericanRock Garden Society *June Hutson* 577-9402
Gateway West Gesneriad Society *Christa Rariden* 776-2823
Henry Shaw Cactus Society *Pat Thomann* 773-2931
Ikebana International
Iris Society of Greater St. Louis
Mid-America Regional Judging Committee of the American Orchid Society *David Brown* 727-2385
Mid-America Regional Lily Society *Fred Winterowd* 423-5313
Missouri Botanical Garden Daylily Society *Mirko Bolanovich* 965-7471
Missouri Mycological Society *Ken Gilberg* 458-1458
Missouri Native Plant Society *George Yatskievych* 577-9522
Missouri Orchid Society *Ron Taube* 961-0577
O'Fallon Iris Society *Roy Bohrer* 240-8780
Orchid Society of Greater St. Louis *Diana Plahn* 965-5007
Rose Society of Greater St. Louis *Carole Sebastian* 993-9270
Saintpaulia Society
St. Louis Evening Herbalists *Marilyn D. Miller* 481-0755
St. Louis Herb Society *Sue Reed* 965-6813
St. Louis Horticultural Society
St. Louis Water Gardening Society
West County Daylily Club *Roy Bohrer* 240-8780

TELEPHONE HELP

The Garden has several telephone services available to assist you.

GardenLine 577-9400
24-hour recorded information about Garden events, hours, admission and directions. Outside area code 314, call **1-800-642-8842** toll free, 24 hours a day.

Horticultural Answer Service (314)577-5143
Monday through Friday, 9:00 a.m. to noon, Master Gardeners are on hand to answer your gardening questions.

Master Composter Hotline (314) 577-9555
9:00 a.m. to noon, Monday through Friday. Specially trained Master Gardeners are on hand to answer your questions about yard waste management techniques. After hours leave a message and your call will be returned. The Master Composter program is supported by the Monsanto Fund.

HortLine (314) 776-5522
24-hour recorded gardening information is available with a touch tone telephone. You will need a brochure listing the hundreds of HortLine topics in order to use the service; you may request a brochure by calling the Kemper Center for Home Gardening at (314) 577-9440, 10 a.m. to 4 p.m. daily, or send a stamped, self-addressed envelope to HortLine, Kemper Center for Home Gardening, Missouri Botanical Garden, P.O. Box 299, St. Louis, MO 63166-0299.

the tree into the house, keep it in the pan of water covered with plastic sheeting to retard drying. Cover the plastic with a tree skirt if desired.

After five days, remove the decorations and place the tree in a cool sheltered area for about a week prior to transplanting into your preprepared site outdoors. Transplanting should be done when the weather is reasonably mild. Using bagged soil mix is not advised, since it is not native to the site and may cause problems with root development. Soil mix is also usually much lighter in texture than the soil of your yard and may not support the weight of the tree in snow, ice, or wind. You will probably want to stake your tree for extra support.

Expect some dieback in the branches or tips to appear in the next growing season. It is not easy for plants that have warmed up to room temperature to endure the outdoors, but if you follow these guidelines you have a fair chance of success.

Do's and Don't's

Above all, DON'T BURN YOUR CHRISTMAS TREE in a fireplace or wood stove. Resins in conifer wood can accumulate in chimneys and cause a flue fire.

Whatever method you choose for disposing of your holiday tree, be careful to remove all of the decorations. Most are reusable, and trimmings left on the tree can contaminate mulch, pollute water, harm wildlife, and cause litter.

Trees that have been flocked, or that have been sprayed with artificial snow, may require special handling. Call the Department of Natural Resources' toll-free number, 1-800-334-6948. ■

The William T. Kemper Center for Home Gardening is open 10 a.m. to 4 p.m. daily. Admission is free with regular Garden admission. For information on classes and activities at the Center, please call (314) 577-9440.

The Plant Doctor is available at the Kemper Center for walk-in consultations from 10 a.m. to noon and 1 to 3 p.m. Monday through Saturday.

Call HortLine for recorded gardening information 24 hours a day! For an up-to-date listing of "Plants in Bloom" at the Garden, press 3 when you call HortLine.

Calendar

continuing through

november 13 sunday

Fall Flower Show

9 a.m. to 5 p.m. daily, Orthwein Floral Hall. Colorful chrysanthemums, sunflowers, zinnias, and other seasonal ornamentals and grasses, in a display inspired by the abstract paintings of Mondrian. Free with Garden admission.

december 2 friday

Members' Preview: Holiday Flower Show

5 to 8 p.m., Ridgway Center. Start off your holiday festivities at the Garden! Entertainment, cash bar. Dinner buffet will be available in the Gardenview Restaurant. Garden Gate Shop will be open. Free, for members only.

december 3 — january 1

Holiday Flower Show

9 a.m. to 5 p.m. daily, Orthwein Floral Hall. A classical garden in the round, inspired by the formal gardens of antiquity, radiates in symmetrical patterns accented with fountains, classical urns and columns. An antique bay tree, *Laurus nobilis*, is decorated as the centerpiece of a central portico, accented by brilliant poinsettias, narcissus, cyclamens, dianthus, garlands, and scores of twinkling white lights. Free with Garden admission. *See December 2 for members' preview.*

november 10 - 12

thursday – saturday

Holiday Preview Sale

9 a.m. to 7 p.m. Thursday and Friday; 9 a.m. to 5 p.m. Saturday; Garden Gate Shop. Members receive 20% discount on all merchandise, all three days; refreshments will be served on Thursday and Friday. Watch your mail, and see page 17 for details.

november 27 sunday

Chanukah: Festival of Lights

11 a.m. to 5 p.m., Ridgway Center. Presented in conjunction with the Jewish Community Centers Association and the St. Louis Circle of Jewish Music. The day will include the fourth annual Chanukah Choral Festival, craft workshops, sing-alongs, Chanukah cooking demonstrations, and a runner representing the Israeli Maccabi Youth Organization, bearing a special torch as part of the Menorah lighting ceremony. The runner is from Modiin in the Judean Hills, where the story of Chanukah originated. Regular Garden admission; choral concert tickets are $5 per person. Call 577-9432 for more information.

december 6 & 7

tuesday & wednesday

Carols in the Garden

5 to 9 p.m. each day, Ridgway Center and grounds. Featuring the Tower Grove House Candlelight Tour. *See back cover for details.*

december 9 - 11

friday – sunday

Holiday Plant Sale

9 a.m. to 7 p.m. Friday; 9 a.m. to 5 p.m. Saturday and Sunday; Garden Gate Shop. Members receive 20% discount on all merchandise, all three days. Refreshments will be served on Friday. Watch your mail, and see page 17 for details.

A Victorian Holiday at Tower Grove House

december 6 - 31 tuesday – saturday

10 a.m. to 4 p.m. daily. Tower Grove House will display its annual Victorian holiday finery. Come tour the historic mansion and delight in its colorful traditional decorations, including garlands, wreaths, and a Victorian Christmas tree, every day except Christmas Day when the Garden is closed.

december 6 & 7 tuesday & wednesday *Candlelight Tour*

The Tower Grove House Auxiliary will offer their annual Candlelight Tour as part of the "Carols in the Garden" Festival, December 6 and 7. *See the back cover for details.*

december 9, 13, 14, 15 *Holiday Luncheons*

Serving begins at noon, Tower Grove House Tea Room. Reservations must be made in advance. Please call Tower Grove House, (314) 577-5150, beginning Friday, November 11 at 9 a.m. Payment must be received no later than November 25, 1994.

The New St. Louis Herb Society Cookbook Is Here!

320 pages, $18.00
Available in the Garden Gate Shop

BACK BY POPULAR DEMAND after almost 20 years, the new St. Louis Herb Society Cookbook is now available in the Garden Gate Shop. Two years in the making, the 400 recipes were compiled, tested, and written by members of the Society, who are already famous for their two earlier cookbooks and for the wonderful herbal vinegars, curry powder, and other herbal preparations they offer for sale.

The all-new original recipes include herbed leg of lamb, rosemary sorbet, cranberry chutney with baked Brie, garlic custard, rose geranium cake, lemon mint tart, rosemary citrus jelly, orange curry cookies, and fragrant soups and breads. Members of the society tested every one, and no concoction went into the book until it won raves from committees of tasters! With an emphasis on light, healthful eating, the recipes use ingredients commonly available in St. Louis markets, so you can experiment even if you don't have an herb garden.

The St. Louis Herb Society was founded in 1941. For years they met at the Garden in the Museum Building. In 1967 the group established the exquisite herb garden behind Tower Grove House, which they still plant and maintain. Members conduct regular education classes at the Garden, hold workshops throughout the year, and provide speakers for community programs. Membership in the St. Louis Herb Society is limited to 60 active members.

"We wanted to put joy and pleasure back into preparing and eating meals," said Sharon Dougherty, a member of the group. "Using herbs creatively to enhance flavor makes it easy to limit fat, salt, and sugar as so many of us are doing today. And it rekindles an interest in savoring and enjoying what we eat!"

Above: Barbara Ottolini (left) and Sheila Hoffmeister, co-chairs and editors of the cookbook project, prepare savory "Green Beans with a Difference" from the new cookbook, using fresh herbs grown in the Tower Grove House garden.

Right: The new St. Louis Herb Society Cookbook is surrounded here by some of the the Herb Society's popular products and produce.

The Herb Society will offer cooking classes featuring recipes from their new cookbook at the Kemper Center demonstration kitchen on Monday, November 14. Classes will be held from 1 to 3 p.m. and from 7 to 9 p.m. Enrollment is limited; please call the Garden's Education Division at 577-5140 for details

Members' Days

every day

Free Walking Tours

1 p.m. daily. Meet the Garden Guides at the Ridgway Center ticket counter, rain or shine, for a fascinating tour of the Garden. Free with regular admission.

wednesdays & saturdays

Garden Walkers' Breakfast

7 a.m., grounds. In cooperation with the American Heart Association, the grounds open early every Wednesday and Saturday morning to encourage fitness walking. Greenhouses open at 9 a.m. Breakfast is available for purchase in the Gardenview Restaurant, 7 to 10:30 a.m.

november 30 wednesday

Holiday Decorating

10 a.m., Shoenberg Auditorium. Join Irene Holmes of Petals by Irene for demonstrations of how to create your own festive holiday decorations. Irene will present wonderful ideas for your home and holiday table. Attendance drawings; seating is limited. Free, for members only.

december 10 saturday

Mid-America Dance Company Presents "The Madcracker"

11 a.m., Shoenberg Auditorium. The beloved holiday classic ballet "The Nutcracker" is brought up to date with zany humor in this delightful parody . The 90-minute performance features 17 wonderful dancers. A treat for the whole family! Seating is limited. Free, for members only.

Members

Holiday Wreaths

December 3 through January 1
9 a.m. to 5 p.m. daily
Ridgway Center

Spectacular holiday wreaths created by some of the finest floral designers in the St. Louis area:

• Botanicals on the Park • Ladue Florist •
Cumberworth's Fine Flowers • Ken Miesner's Flowers
• Jon Prel Floral Design • Jody Delf •
• Randy Felkey Florals • Dale Rohman •
Hereford-Andrew Design • Bozzay Florists
• Designs of Distinction •
• Charles W. Freeman •

Thank You!

"Best of Missouri" Market Sponsors

Commerce Bank
Monsanto Company
Premier Homes Inc.
The Boatmen's National Bank of St. Louis
St. Louis County Farm Bureau
First Bank

Holiday Gift Membership Special — Save 20%

During the Holiday Plant & Gift Sale December 9, 10, and 11, you may purchase a $45 Garden membership for just $36, or a $40 senior membership for just $32, a savings of 20 percent!

Then enjoy the 20 percent members' discount in the Garden Gate Shop, or give a membership as a gift that will delight family and friends all year long. Each gift recipient will be sent a limited edition set of ten Missouri Botanical Garden note cards and a holiday greeting from you.

There's Still Time!

Tour de France: Nov.12

Garden members are invited to a gala evening of music, dancing, and the glorious food and wines of France. The party will be held at Ces & Judy's Le Chateau to benefit the Missouri Botanical Garden. Tickets are $100 per person. Please call 577-9500 for last minute reservations.

Shaw Neighborhood Shops Offer Special Discounts to Garden Members

During the Garden Gate Shop's November and December Holiday Sales, the merchants in the Shaw Neighborhood are offering a special welcome to Garden members, including discounts of up to 20 percent. The shops are located at at Shaw and Vandeventer, just one block west of the Garden. Present your Garden membership card for special discounts at The Bug Store, Surprise!, Retreads, and Hercules Designs.

Now Your Membership Is Worth More than Ever

Due to financial constraints, beginning January 1, 1995, visitors will be charged admission to Garden flower shows. Admission for ages 13-65: $2 plus Garden admission; seniors: $1 plus Garden admission. As always, Garden members will be admitted to the flower shows free, and upper level members ($75 and above) may bring up to ten guests free.

GARDEN GATE SHOP

Receive 15% Members' Discount on Holiday Cards When You Order by Mail!

1994 MBG Holiday Card

THE 1994 Missouri Botanical Garden Holiday Card is a charming view of Tower Grove House, complete with Henry Shaw and his friends and family enjoying a sleigh ride. This whimsical scene is painted in full color by local artist Ann Thompson, the third in her series of Garden cards for the holidays.

This year it is even easier to support the Garden by sending these delightful cards. If you order by mail you will receive a 15 percent discount, shipping and handling additional; or purchase cards in the Garden Gate Shop at the usual ten percent members' discount. Cards come in sets of 12 with 12 envelopes for $12.00 per box. To order, you may call the Shop at (314) 577-5136 Monday – Friday, 9 a.m. to 5 p.m.

MBG Notecards

"The Garden", a handsome set of boxed notecards, features six of Jack Jennings' wonderful color photographs. Each box holds 18 cards and envelopes, $12.95.

Holiday Preview Sale

November 10 – 12, 1994
Thursday & Friday *9 a.m. to 7 p.m.*
Saturday *9 a.m. to 5 p.m.*
Members take 20% off all merchandise.
Refreshments will be served on Thursday and Friday.

Get your holiday shopping done early at the Garden Gate Shop! The Shop is featuring all of the items on this page, plus an enchanting array of holiday decorations, gifts, and books, including *A World of Plants*, the spectacular book on the Garden from Abrams.

Holiday Plant Sale

December 9 – 11, 1994
Friday & Saturday *9 a.m. to 7 p.m.*
Sunday *9 a.m. to 5 p.m.*
Members take 20% off all merchandise.
Refreshments will be served on Friday.

Fill your home with blooming color for the holidays, with brilliant poinsettias, Christmas cactus, small live decorated Christmas trees, and other seasonal blooms. And take advantage of another opportunity to stock up on the Shop's charming array of gifts, where you'll find something for everyone on your list.

1995 Garden Calendar

The new Missouri Botanical Garden Calendar for 1995 is available in the Shop, with wonderful new full color photographs by Jack Jennings. The 16" x 12" poster-size calendars include a full color poster on the *Flora Mesoamericana* Project and the Garden's research program, and are priced at $10.95. Members receive a ten percent discount, plus shipping and handling. You may call the Shop at (314) 577-5136 Monday through Friday, 9 a.m. to 5 p.m

A NEW TASTE

Fresh from the Garden

HAVE YOU EVER WISHED you could take some of the delights of the Garden home with you — or share them with a friend far away? Now you can! The Missouri Botanical Garden introduces an exciting new line of herbs, spices, and condiments, straight from the kitchens of Ces & Judy, the talented chefs of the Gardenview Restaurant. These charming jars and gift packs are competitively priced, just right for holiday gift giving.

OLIVE OIL & HERBS
Extra virgin imported olive oil infused with the rich fragrance of rosemary or basil and garlic.

DRIED HERBS
Locally grown basil, oregano, thyme, rosemary, garlic, and whole black peppercorns.

DRIED SHIITAKE MUSHROOMS
Organically grown in the Missouri Ozarks by Bald Eagle, Inc.

FRESH SALSA
Spark your meals with the vibrant colors and flavors of fresh tomatoes, chilis, onions, cilantro, herbs and spices, in a chunky concoction that's not too hot, not too meek — just right.

FRESH BEAN DIP
Olé! A hearty, flavorful combination of pinto beans, peppers and spices.

BARBEQUE SAUCE
Deep and dark, thick with spices and brown sugar, rich with the flavor you've been looking for — this one is The Ultimate.

FRESH CON QUESO
Real cheddar cheese and spicy chilis combine for a luscious dip.

Claiborne/Ortenberg Foundation Helps Build for the Future in Ecuador

IMAGINE A NATURE PRESERVE where students can study environmental education right in the tropical forest. Add a public garden where people can learn about the economic importance of their native plants. These innovative ideas are active and thriving at the Jatun Sacha Biological Station in Ecuador, thanks in part to funding from the Liz Claiborne/Art Ortenberg Foundation.

Educating the local residents about the value of their natural resources enlists their support in preserving a priceless biological heritage for all of us, far into the future.

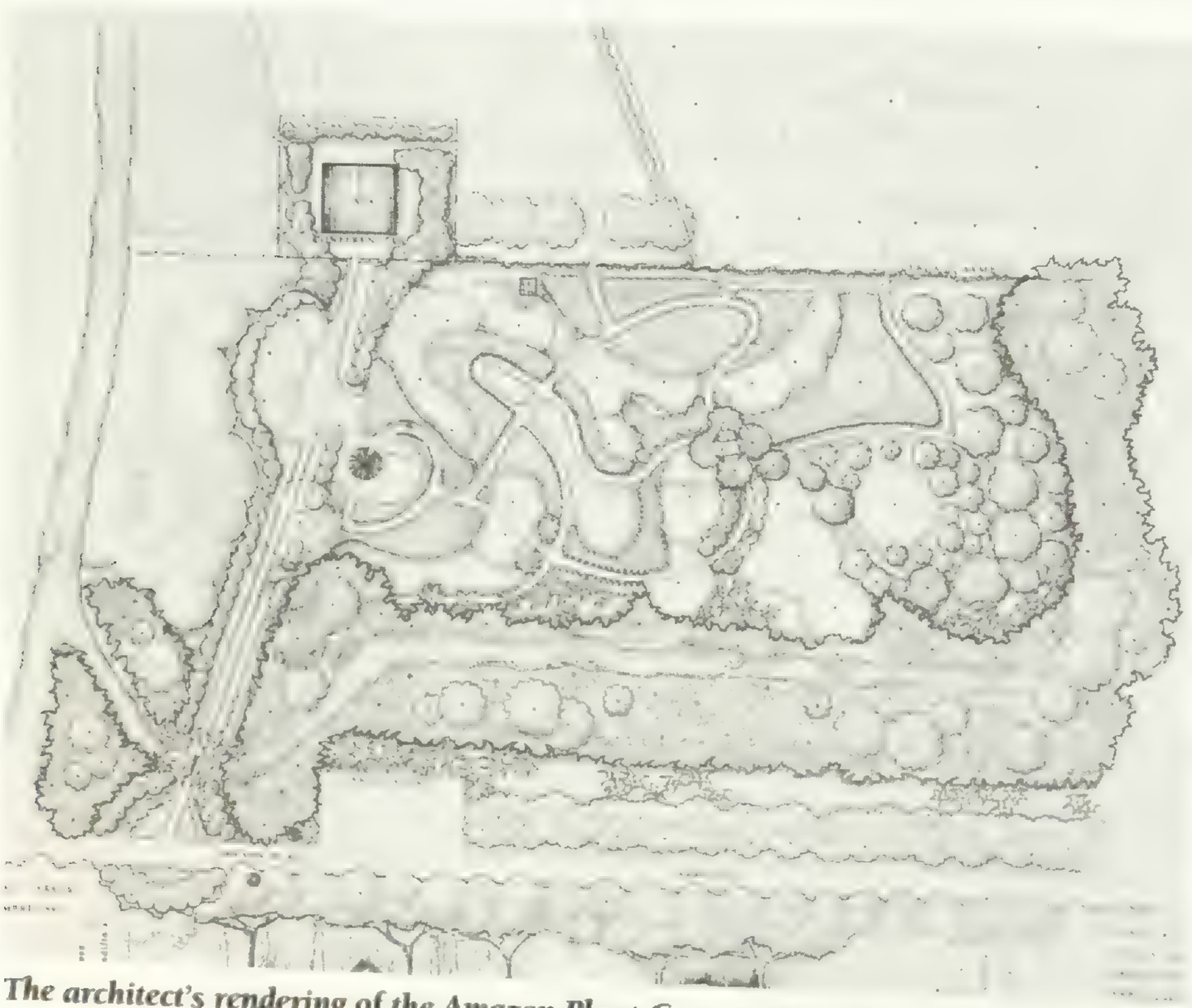
Jatun Sacha is a nature preserve dedicated to research, education and conservation. Co-founded by Garden curator David Neill and administered by the Jatun Sacha Foundation, the station is located in the mountains of Ecuador, one of the biologically richest regions in the world.

The education and conservation program supported by the Claiborne/Ortenberg Foundation has two components. The first places teachers in local schools in the rural areas and small towns near Jatun Sacha. The teachers, who speak Spanish or the native Quichua language, supplement the natural science curriculum in the schools with an emphasis on the ecology and conservation of tropical forests. Students make regular field trips to the biological station to experience the ecosystem they are studying.

The second component of the program is the Amazon Plant Conservation Center, a small botanical garden established at Jatun Sacha. The project will feature research, education and conservation of some of the economically important native plants of Amazonian Ecuador, concentrating on medicinal plants and native species of fruit and nut trees. The center was designed by Judith Parker, a landscape architect from Miami who specializes in tropical gardens.

During the past year the education program has been expanded to include adults in the community. Training courses were developed for local ecotourism guides, and an Agroforestry Extension Program was designed to promote sustainable agricultural practices among the local farmers. A health education program for women from the rural area around Jatun Sacha included sanitation and development of vegetable gardens.

"We are extremely grateful to the Claiborne/Ortenberg Foundation for supporting this farsighted approach," said David Neill. "Educating the local residents about the value of their natural resources enlists their support in preserving a priceless biological heritage for all of us, far into the future."



The architect's rendering of the Amazon Plant Conservation Center, a new botanical garden at Jatun Sacha Biological Station

Tinker Foundation Supports Garden Programs in Ecuador and Bolivia

THE GARDEN'S PROGRAMS in Ecuador and Bolivia will be bolstered by an $80,000 three-year grant from the Tinker Foundation. The Garden has had an impact on the environmental policy of both Ecuador and Bolivia. The Tinker Foundation grant will make it possible to strengthen efforts to provide vital information that will help these countries policymakers make decisions about the country's environment and natural resources.

In Ecuador, the Garden helped to establish the national herbarium and library with support from debt-swap funds, which are beginning to run out. The herbarium and library are now functioning effectively as a national information center on the flora and vegetation of the country, under the direction of Dr. David Neill, the Garden's resident botanist in Ecuador. Solid scientific information is necessary before sound environmental decisions can be made. Before the Garden began working in Ecuador in 1985, such information was not available to Ecuadorian policymakers.

The Garden began its efforts in Bolivia in 1981, where it has been working with Bolivian institutions dedicated to botanical inventory, plant ecology, conservation and sustainable use of biological resources. Early years were dedicated to plant collecting and assistance in the establishment of the national herbarium. Training has always been a priority, and in recent years the effort has become more focused as more Bolivians have entered the field of botany. The Garden is also conducting research projects that are having an impact in environmental policy in Bolivia and have been helpful in the establishment of the boundaries of protected areas in the country.

The Garden's efforts have helped to establish definitively the incredible botanical diversity of both Bolivia and Ecuador, and the impact of the Garden's projects on the two countries' environmental policies has been profound. But the projects are expensive. Through the support of the Tinker Foundation, the Garden's important work will continue.

CLIFF WILLIS

Symposium speakers and moderators included (back row, from left): Russell K. Monson, Richard I. Vane-Wright, P. Mick Richardson, Michael Vecchione, Michael J. Balick, Brent D. Mishler.
Front row, from left: Nancy R. Morin, Jay M. Savage, Amy Rossman, James H. Oliver, Jr.

"Systematics Agenda 2000" Discussed at Annual Symposium

WITH thousands of species becoming extinct annually, as many as half of all species may disappear by the year 2050. How will we know what organisms have become extinct if we do not know what was there in the first place? At the Garden's 41st Annual Systematics Symposium, "Systematics Agenda 2000: Systematics and Society," scientists from around the world discussed the importance of discovering and classifying all organisms and the potential impacts on human society. The symposium was held at the Garden on October 1, 1994.

Systematics Agenda 2000 is a joint effort by the American Society of Plant Taxonomists, the Society of Systematics Biologists and the William Henning Society, in cooperation with the Association of Systematics Collections, to design a global initiative to discover, describe and classify the world's species over the next 25 years. Meeting the challenges of the biodiversity crisis and successfully completing this agenda will require an intensive international effort.

Papers were presented from scientists from the United States and England. The keynote speech was given by ethnobiologist Michael J. Balick of the New York Botanical Garden.

According to Dr. Mick Richardson, "It's now or never. The rapid rise in the human population of the earth is driving many species of plants and animals to extinction. No species exists on its own, all are interdependent. The extinction of one organism may have great repercussions on other organisms." Richardson, a co-organizer of the symposium, is the manager of Graduate Studies at the Garden.

Since 1954, the Systematics Symposium at the Garden has received support from the National Science Foundation nearly every year, including 1994.

CLIFF WILLIS

Distinguished Japanese Botanist Visits the Garden

Professor Kunio Iwatsuki, director of the Botanical Gardens at the University of Tokyo, visited St. Louis at the end of September to attend the Garden's Systematics Symposium and meet with colleagues. Prof. Iwatsuki is the world's leading authority on the ferns of East Asia and a co-author of treatments of Asian pteridophytes for the *Flora of Thailand* and the forthcoming *Flora of Japan*. He is collaborating on the Missouri Botanical Garden's work on ferns. At left, Prof. Iwatsuki (center) is shown meeting with Garden researchers (left to right) Ihsan Al-Shehbaz, Peter H. Raven, James L. Zarucchi, and William Tai.

Barbara Addelson Is Appointed Manager of Science Outreach

CLIFF WILLIS

Barbara Addelson

BARBARA ADDELSON, who has been on the education staff at the Garden for over seven years, has been appointed to head Science Outreach for the E. Desmond Lee Family Education Program. The position was created by a generous gift by E. Desmond Lee and his family to fund science education programs for underserved city schools.

Ms. Addelson came to the Garden in 1987 as an instructor in the ECO-ACT program and was promoted to instructional coordinator in 1990. She administered the ECO-ACT program, the magnet school program, and school partnership projects. She is well acquainted with the schools, principals, teachers, and school officials with whom she will be working in her new job.

Ms. Addelson said, "In addition to providing direct science instruction to elementary students, the generous support of the Lee family affords us a great opportunity to work closely with educators in the community to effect long-term changes in the way that science is taught. I'm excited about the prospect of coordinating our outreach efforts and I believe we can have a very positive impact on science education in St. Louis."

As the manager of science outreach, Barbara will help to

ADDELSON continued

conceive, develop, and plan programs that will improve the way science is taught in non-magnet elementary schools. She will coordinate training for teachers in utilizing hands-on learning activities and investigative approaches. She also will be responsible for seeking additional funding to expand science outreach programs.

"Barbara has demonstrated exceptional administrative, organizational, and programmatic skills, and she will do an absolutely wonderful job as our science outreach manager," said Dr. Larry DeBuhr, director of education at the Garden.

Garden Produces Third Educational Video Series

THE EDUCATION DIVISION at the Garden has collaborated with Herb Halpern Productions to produce a third educational video series for elementary school classes. This series, called *The Environment*, includes six videos on environmental concepts. Each program features a group of children as they try to solve a mystery. This format allows the videos to introduce important issues in environmental science in an entertaining and interesting way. The programs utilize a combination of live action and graphic sequences to help students understand important issues and concepts.

The videos in *The Environment* series are:

The Mystery of the Dead Fish —
Major Elements of the Environment
The Case of the Mysterious Neighbor —
Water: Resources and Pollution
The Mystery of the Statue —
Air: Resources and Pollution
The Missing Ingredient —
Endangered Biological Resources
The Lost Book Report Caper —
Waste Disposal: Nothing Ever Leaves the Planet
The Power Puzzle —
Energy and Environment

The Garden's two earlier sets of educational videos, also produced in collaboration with Herb Halpern Productions, have been extremely successful and are being used in more than 13,000 elementary schools across the United States. A set of six videos from any of the three MBG series is priced at $195.00, plus $7.50 shipping and handling. For information on purchasing any these video series, please call Herb Halpern Productions at (314) 968-1570 or 1-800-927-9229.

HERB HALPERN PRODUCTIONS

A scene from "The Missing Ingredient" video

Henry Shaw Academy Winter Classes

The Garden's Henry Shaw Academy is for students ages 7 to 18 who are interested in learning more about science and ecology. The classes and field programs for Fall 1994 and Winter 1995 reflect the coming seasons and programs at the Garden. Call (314) 577-5135 for registration and more information.

Ages 7 to 9:

"Oh, Give me a Home...Tall Grass Prairie Ecology" *October 8*
"Woodland Wanderings" *October 15*
"Harvest! Preparing for Winter" *November 12*
"Natural Wreathmaking" *December 10*
"Orchids for Lunch" *January 28*

Ages 10 to 12:

"Water, Water Everywhere: Aquatic Ecology" *October 1*
"River Ecology — The Fall Season on the River" *October 15*
"Cave Ecology: The Underground World" *November 19*
"Natural Wreathmaking" *December 10*
"Wake up to Orchids — Orchid Ecology" *January 28*

Habitat Helpers were busy on the prairie this fall.

Arboretum Cooks Up a New Pilot Program: "Habitat Helpers"

HOW CAN YOU NURTURE a budding interest in natural history? How can you empower a child to do something about the growing ecological crisis? Try "Habitat Helpers"!

Basic Ingredients:
Twelve fifth grade students from the local Meramec R-III district
Shaw Arboretum's natural communities
Seven weekend meeting times throughout the school year
Arboretum education staff

Directions: Start by mixing together the 12 students, using an overnight weekend at the Arboretum log cabins led by Arboretum education staff. Sprinkle with rain. Knead in activities that will make the students' interest in the natural world rise. Stir up their desire to help improve the state of the environment. Add a project to restore some of Missouri's native vegetation. Bake for one school year. Serves 12 students, their parents, the Arboretum, and possibly, future generations.

As you can see, the Arboretum is really "cooking" with the new "Habitat Helpers" program. We, the Arboretum eduction staff, are very excited to be working with the same group of students for the full year. During the course of the year these students will learn, hands-on, the process of ecological restoration. The students will collect seeds from local native plants, process, stratify, plant in the greenhouse, prepare the site, and ultimately, plant these in a prairie site behind the log cabins. In the process they will also learn about seed dispersal, soils, plant and animal interrelationships and adaptations, and identification. A journal will be an ongoing means of documenting the plants' progress as well as making natural history entries.

With all the proper ingredients, plus some fun sprinkled in, we are hopeful that this new program will yield some kids who have more insights about the workings of the natural world and are inspired to save and rebuild their local environment.

— Miriam Krone, Arboretum Education Staff

Garvey Foundation Supports Education for Seniors

The Edward Chase Garvey Memorial Foundation has awarded the Garden $8,000 to expand educational programming for senior citizens. This grant will enable the Garden to develop new outreach classes that will be delivered to senior citizen centers throughout St. Louis by specially trained volunteers. In addition, new slide programs on "Missouri Wildflowers" and "Medicinal

continued above

GARVEY FOUNDATION continued

Plants" will be developed and loaned to senior citizen centers. The Garden will also purchase portable transmitters for assistive listening devices to use in the eduction classrooms in Ridgway Center.

"This generous contribution by the Edward Chase Garvey Memorial Foundation allows the Garden to move ahead with its plans for expanding senior citizen programs, and we are grateful to the Foundation for its support," said Dr. Larry DeBuhr, director of education.

Allium giganteum

SIR PETER SMITHERS GIVES PHOTOGRAPHS TO THE GARDEN — The world famous photographer Sir Peter Smithers has made a magnificent gift to the Garden of 12 photographs that he displayed at the Garden last November. Six of the large format color prints were given in memory of his mother-in-law, Mrs. Thomas M. Sayman of St. Louis, and six in honor of Dr. Peter H. Raven. All of the photographs were made in Sir Peter's garden at Vico Morcote, Switzerland, where he has created a garden of more than 10,000 species and cultivars. Sir Peter, who retired from a career in political and international service in 1970, is a self-taught photographer. He was born in 1913 and educated at Harrow and Oxford. He is a former member of Parliament, a Chevalier de la Legion d'Honneur, and has received seven Gold Medals and the Grenfell Medal from the Royal Horticultural Society, in addition to many other honors. His photographs have been exhibited all over the world. "This is a splendid addition to our collection," said Dr. Peter H. Raven, director. "We are profoundly grateful to Sir Peter and Lady Smithers for their generosity to the Garden."

ECO-RESTORATION AT SHAW ARBORETUM

Butterflies, Ants and Lizards Return to the Prairie

Regal fritillary, *Speyeria idalia*

ONE of the chief priorities at Shaw Arboretum is ecological restoration — bringing back the original balance of plants and animals that existed in natural areas before they were altered or damaged by agriculture, development, and introduced species. Today the prairie, wetland, and woodland areas at the Arboretum are thriving showcases of native wildflowers, birds, and other species.

Recently the staff began a new phase of restoration by introducing threatened animal species to the Arboretum. New additions to the prairie include two dozen colonies of prairie mound ants, *Formica montana*, and 27 mated female regal fritillaries, *Speyeria idalia*. Both of these species are moderately abundant in the few, small areas where they remain in the wild, but their survival is threatened as they are entirely restricted to unplowed remnants of original tallgrass prairie.

Local Extinction

The Eastern collared lizard, *Crotaphytus collaris*, is found from the southwestern United States to the Ozark glades of Missouri. Loss of habitat and collecting for the pet trade have led to extinction locally, and populations of the lizards have been reduced throughout their range. With the introduction of seven adult lizards this past summer and more planned for next year, the staff hopes to establish a breeding population at the Arboretum. One immature lizard was seen at the end of the summer, inidicating initial success.

Eastern collared lizards, *Crotaphytus collaris*

The ants and butterflies are expected to establish their populations without difficulty, but we will need to be vigilant to protect the fledgling lizard colony. Unauthorized collecting of reptiles has been a threat to populations at the Arboretum in the past, as well as driving the lizards to extinction in the area.

January Deer Hunt at the Arboretum

THE SEPTEMBER-OCTOBER 1994 *Bulletin* carried an article about the nationwide impact of North America's burgeoning deer population on protected woodland areas. Convincing evidence of the negative impact of deer on prairie vegetation is continually brought to light at professional meetings and conferences. The damage resulting from deer populations is so high that nearby woodlands are no longer able to support them.

Until recently, deer populations in this region have fluctuated from 5–15 per square mile. They were maintained at this level by the hunting activity of wolves, cougars and humans and by competition from other herbivores, including the extinct passenger pigeon, which once numbered in the billions and consumed much of the annual acorn crop. While the ecosystem can and does support higher deer levels, it does so at a cost: when deer fill more of the available habitat, there is less space for other creatures.

Today, managers of natural areas are faced with a choice between allowing large numbers of deer to devour their habitat to the state of biological impoverishment, or managing deer at lower levels for the overall health of the ecosystem. Managers whose natural areas have experienced damage more serious than at Shaw Arboretum have been forced to drastically reduce deer herds. The Cook County forest preserves near Chicago, the University of Wisconsin Arboretum, and several of Missouri's state parks closer to home are examples of areas forced to pursue significant reduction. At Shaw Arboretum, an effective way to remedy the deer overpopulation has been sought to keep the problem from reaching crisis proportions as it has in these other areas.

As more and more land is developed, it has become vital that refuges such as parks, conservation areas and arboreta be managed properly to maintain the diversity they harbor. At Shaw Arboretum, this is even more important because the goal is not only to protect existing diversity, but to enhance the diversity of our old fields and second-growth woodlands through ecological restoration. A deer-free fenced zone protects the horticultural collections of the Pinetum and Whitmire Wildflower Garden areas. However, over 2200 acres of the Arboretum remain unfenced, and the current deer population (monitored by annual helicopter surveys) is now around three times the historical level. The trained eye can easily detect damage to the plant community, and this is especially noticeable in recent plantings such as the expansions of the prairie or the wetland.

Careful consideration of deer population management options, including live-trapping and immunocontraception, has turned up no effective or humane alternative to a managed hunt. Immunocontraception (birth control) is still in a research phase and not yet practicable on a free-roaming herd on large acreage such as the Shaw Arboretum, but the method is being studied as a possible future alternative to hunting. To avoid facing an even more serious deer problem and creating more damage to the ecosystem at the Arboretum, a hunt will occur January 7-8 and January 14-15, 1995. Shaw Arboretum will be closed those weekends.

Ancient Artifacts of Native Americans Found at the Arboretum

LAST YEAR the staff of the Arboretum found a number of stone spear points three to five inches long in a field on the eastern edge of the property. In December the site was examined by Joe Harl and Dennis Naglich of the Archaeological Research Center of St. Louis, who determined that the spear points are of a type popular between 3,000 and 2,000 B.C., which was probably when the site was utilized.

Left: Students sifted the excavated soil through fine screens to recover even the smallest artifacts.

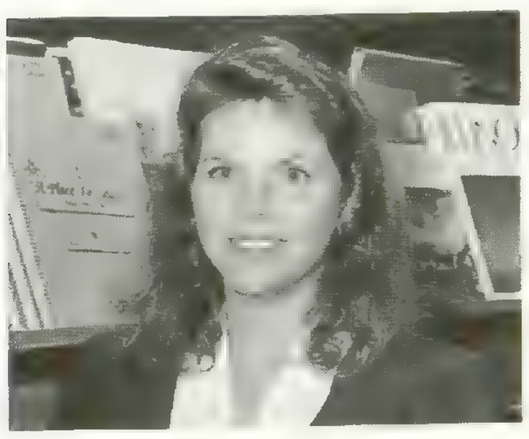
Few sites dating from this period have been investigated by professional archaeologists in Eastern central Missouri. This summer a group of students from East Central College, under the direction of Joe Harl and Tim Baumann, conducted meticulous test excavations to determine the site's condition. Most sites of archaeological interest in the Midwest have been destroyed by years of agriculture and erosion. Only occasionally is a site found where historic materials are still undisturbed below the plowing zone, about eighteen inches beneath the surface.

The student detectives excavated less than 1/2-inch of soil at a time, and all sediment was passed through a fine wire screen to recover even the smallest artifacts. Every find was saved, with careful annotations of its precise location and depth. It is the placement of the artifacts in relation to others that provides insight into the lives of past people.

While no undisturbed remains such as house structures, storage pits, cooking hearths, or implements were found, the finds did indicate that the site was probably used as a hunting camp or a place where plants were gathered and processed before returning to the main residential village. A fragment of a stone arrow tip of a type dating from 600 A.D. may indicate that the site was used repeatedly through time. More recent artifacts revealed that early European settlers also used the site

The Native Americans who first used the site probably came from one of the large villages recently identified just across the Meramec River to the south. The Meramec valley supported many Native American settlements in the past, and the archeologists are interested in exploring other potential sites at the Arboretum next summer. Displays in preparation for the Manor House at the Arboretum will feature the history of land use in the area, including the settlements of Native Americans.

Behind the Scenes



CLIFF WILLIS

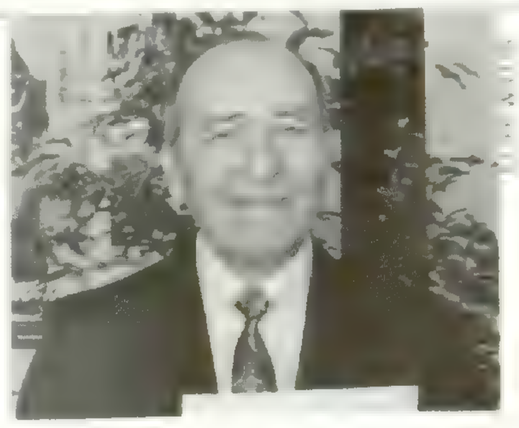
Kimberlee Rainey Is New Manager of Garden Gate Shop

KIMBERLEE RAINEY joined the staff in September as manager of the Garden Gate Shop. She comes to the Garden with over seven years of retail experience with major corporate organizations, including Anheuser-Busch and First Names First, Inc.

Ms. Rainey began her retailing career as a buyer and then business analyst for Sea World of Florida, the Anheuser-Busch Theme Park in Orlando. As a regional manager for First Names First, Inc., of Orlando, she developed and supervised retail units at Six Flags Mid-America, Mall of America in Minneapolis, Sea World of Texas and Sea World of Ohio. She holds a B.A. in international trade and foreign language from Auburn University.

Kim said, "I am delighted to be part of an organization such as the Garden, whose mission encompasses both environmental and civic services. I look forward to working the the Garden staff and I hope our cooperative efforts and the experience I bring to the Garden Gate Shop will further the mission of the Garden and exceed the expectations of the members."

"We are pleased and proud to have Kimberlee at the Garden," said Michael Olson, controller and director of Ridgway Center Operations. "Her experience and qualifications are outstanding, and we look forward to seeing the Garden Gate Shop develop under her guidance."



THIRTY YEARS ON THE STAFF — The Garden honored Leonardo R. Mourre for 30 years of service at a staff meeting on August 17, 1994. Mourre came to the Garden in 1962 at the age of 38 from his native Ecuador. After a year's leave of absence in 1963, he returned to the Garden in 1964 and has worked here ever since as a botanical illustrator and plant mounter. His beautiful drawings illustrate the *Flora of Panama* and *Orchid Flowers, Their Pollination and Evolution*, by van der Pijl and Dodson. Leonardo is part of the Bryology Department, where he prepares over 1,000 herbarium specimens each month.

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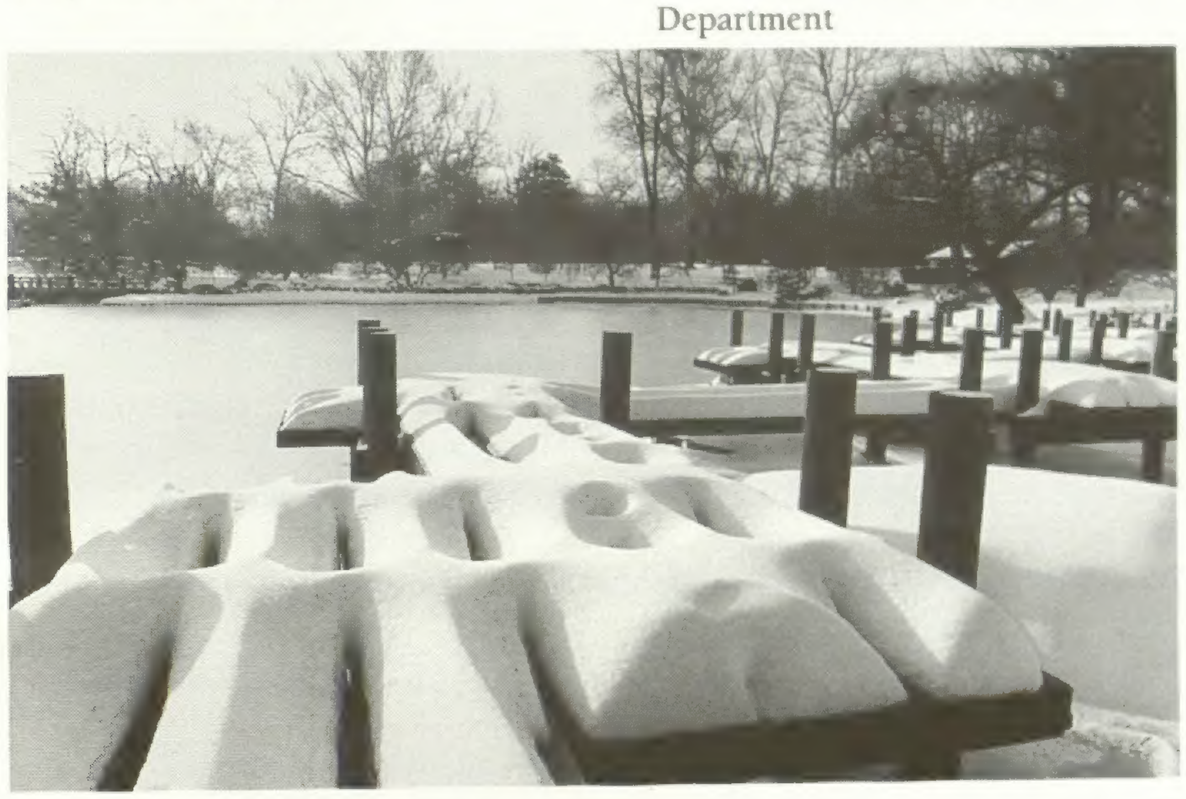

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Second Annual

Carols In the Garden

A Winter Night's Celebration
Featuring the Tower Grove House Candlelight Tour

Tuesday & Wednesday
December 6 & 7, 1994
5 to 9 p.m.

The sounds of holiday music fill the air as carolers roam the Garden and revelers make their way along candlelit paths to Tower Grove House, where they are welcomed by Henry Shaw. Within, Shaw's historic country home is richly decorated in all its finery for a real Victorian Christmas tour, filled with soft candlelight and warmed by holiday cheer. Santa Claus will be on hand at Spink Pavilion to greet young visitors with goodies and treats. Featured entertainment includes the popular vocal group "Pieces of 8."

Admission to the Festival only:
$4 for members and seniors,
$6 for non-members,
$2.50 for children age 12 and under.
Candlelight Tour: Additional tickts are required for the Tower Grove House Candlelight Tour: $9 per person.

Admission is by paid reservation or pre-event ticket purchase only.
Tickets will be available beginning November 1, 1994 at the Ridgway Center Ticket Counter, or phone (314) 577-5125 for reservations.

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